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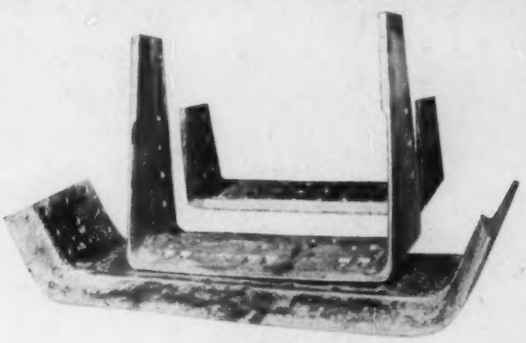
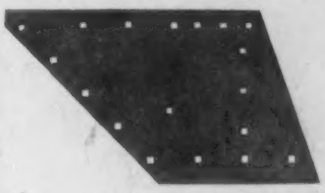
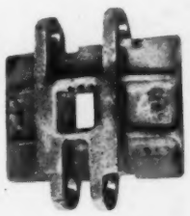
DIGGER TEETH



DIPPER LIPS

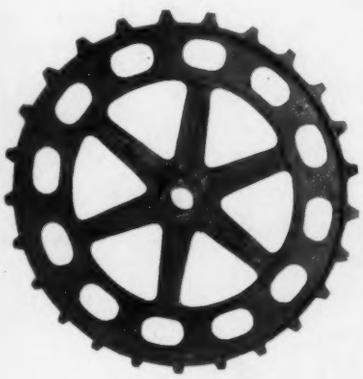


SIDE PLATES



CATERPILLAR TREADS

FARRELL'S 85



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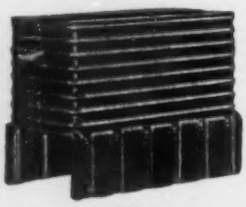

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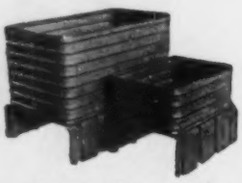

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BOXES AND PLATFORMS

Welding an 8-inch oil pipeline in a "bell hole"

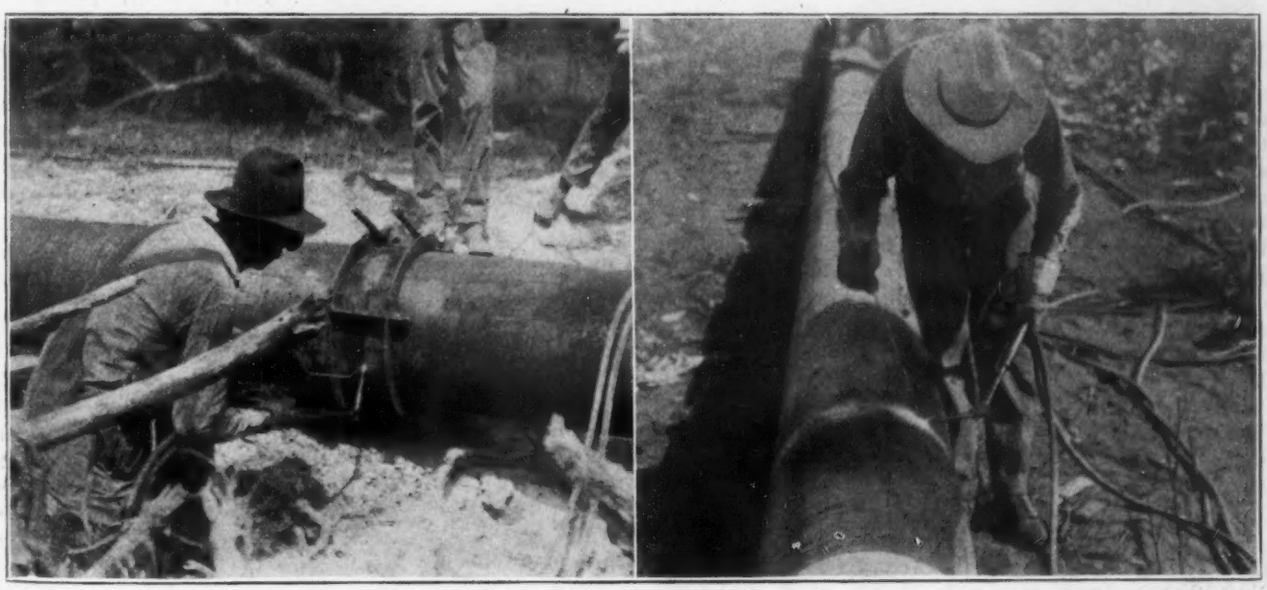
Welding of Pipelines Gains Oilfield Approval

By Dudley W. Moore

SEVEN years ago welded pipelines were practically unknown, that is, successful welded lines. At that time the work was undertaken largely by amateurs and was regarded by the public as sort of a soldering proposition. Therefore, it is not difficult to understand why confidence in the practice was lacking.

Failure of early attempts at welding pipelines was due primarily to the welders themselves for men with practical experience were scarce. Some of the oil companies provided schools for beginners but these were not wholly successful as the instructors lacked experience and knowledge of the subject. Welding practice hardly had developed far enough to bring out men thoroughly familiar with the subject, especially as it concerned pipelines.

Today, the situation is different. One of the largest refinery and pipeline companies near Tulsa, Okla., has a school where welders are trained and sent to the field for seasoning. This company maintains a check on its welders by posting their efficiency grades on a bulletin board each week and the operator who scores highest is allowed certain credits which at the end of a definite period aid in promotion. This system has been found to encourage better results and makes better welders. Another of the early-day mistakes



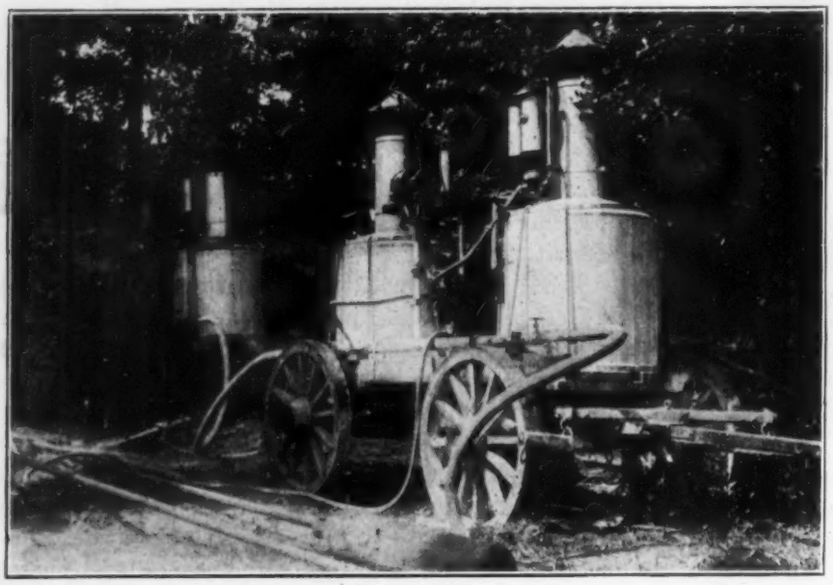
(Left)—This shows how clamps are used to line up pipe joints prior to tacking. (Right)—Finishing a gas welded joint in a 16-inch gas pipeline

was in selection of equipment, little attention being given this item. An acetylene torch probably is the most important piece of equipment, but then little care was used in its selection. The torch must be adapted to strenuous service, must be economical, well built, well balanced and easily adjusted to varying pressures. Auxiliary torch equipment should measure up to the standard maintained in the torch. Next to the torch, the filler rod is of major importance, and experience has shown that the standard Norway iron with low carbon content will give best results.

A pipeline weld once was considered as strong as the pipe itself, but today the weld is made weaker because surface temperature. The drop in temperature creates within the pipe a vacuum which will register on a delicate gage. The smallest leak will prevent creation of a vacuum and the leak must then be located by the usual method.

Welding Gains Recognition

Respect for the welding in pipeline work has been built up by high standards of valuation and performance rather than by low standards of cost. As a matter of fact, it costs more to make 100 per cent welds and it costs tremendously more to place pipe in a ditch under present rigid specifications, an increase of approximately 60 per cent over old methods. The welding process now is where



A battery of portable generators employed in welding a large gas pipeline. Three generators are in service, the fourth being held for emergency. The small pipe is the acetylene line

contraction and expansion must be considered. In proper distribution of slack to prevent breakage by contraction or expansion, care must be exercised, especially over uneven ground, as too much will cause the line to arch above the ditch. If this is not cut out, it will creep to the nearest overhead and push that out of the ditch, thus loosing the slack and buckling the bend. If there is not sufficient slack, the result will be a tight line which will break the weld or pull the sag from the bend. The amount of slack required depends upon the width of the ditch above the diameter of the pipe.

How Weld Is Tested

In testing for leakage in a welded line, the line with both ends closed air tight is placed in the ditch where the temperature is lower than the it should have started. The early day handicap of "how cheap rather than how good" is being overcome as welding progresses but it gave the process a setback.

Formerly, welding job estimates were submitted on certain bids in order to get within a certain cost figure in competition with other methods. A line was classified by weight of pipe and whether it carried vacuum, gas, oil or water. In other words, bids were submitted according to whether the lines were low or high pressure. Contractors since have put into practice standardized welds system by which, regardless of pipe size, class of service, amount of pressure or whether oil, gas or water, the weld must be of such size and quality as to meet every requirement of handling, bending, pressure or service.

In construction of pipelines in the oil country, the acetylene weld has been eminently successful. Recent completion of the Marland Oil Co.'s 8-inch line in the Panhandle, Texas, region with welded joints brought out some new features of this type of construction. In the building of the line severe specifications were required that "Obstruction (or restriction) would be minimum and strength of line maximum," as the oil in this field congeals at 50 degrees and constant attention was required in the engineering practice.

When complete, a cold water test of 850 pounds pressure and four days duration failed to disclose any fault in the line. In testing on bends or other restrictions, three scrapers made the passage without a stop. The minimum depth of cover was 32 inches which is ample in protection against all weather conditions. At points where canyons were crossed, the line was run level across on truss supports and the exposed surface was insulated. The construction of scraper boxes permitted the insertion or delivery of the scraper without interfering with the flow of oil.

Doubt exists among some engineers as to the successful application of the completely welded process in lines of over 12 inches in diameter but welding exponents assert that a successful line is not limited to diameter but to the engineering ability of the contractor or builder. Many of the major oil companies are operating today proven lines of 12, 16 and 20-inch pipe for oil and gas transportation. Welded water lines of 60 and 65-inch diameter are now being built and operated on the Pacific coast. Engineers who hesitate at welding a whole line are unanimous in their approval of welded river crossings, swamp or canyon crossings where severe strains occur without regard to diameter of line. It seems probable that the future will find welding becoming accepted and universal for all classes of pipeline work.

School in New Quarters

Celebrating simultaneously the twenty-third anniversary of its establishment and the dedication of its new quarters at Oneida and Jackson streets, the School of Engineering of Milwaukee held open house from Dec. 16 to 18 with elaborate ceremonies. The school specializes in electrical engineering and has more than 20,000 graduates. The institution's own radiocasting station, WSOE, has been moved to the new building and represents considerable enlargement and improvement.

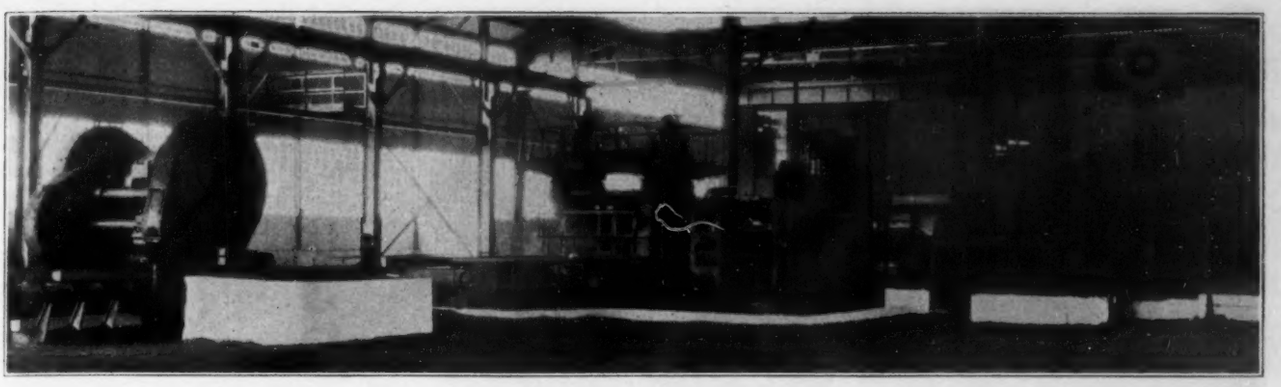


Fig. 8—General view of the 35-inch blooming mill, the 3-high stand of pinions and the driving unit. The bloom shear is shown at the left

Bearings Require Clean Steel-II

Ingots Converted Into Blooms by 3-High Mill in the Control of One Operator—Seamless Mill Produces Stock for the Cones and Cups—Merchant Mill Supplies Bars and Rods for the Taper Rollers

By John D. Knox

ALL steel manufactured at the plant of the Timken Roller Bearing Co. is top poured into inverted molds of the fluted type to permit uniform contraction, as mentioned in the Dec. 23 issue of IRON TRADE REVIEW. After standing for 1½ hours without disturbance the molds are transferred to the soaking pit building which houses three 2-hole pit furnaces. These are of the regenerative type and are fired with natural gas because of the cleanliness afforded. Each compartment is 6½ feet wide and 11 feet long, and holds from eight to ten ingots. The pit covers are mounted on wheels equipped with roller bearings and are operated by a 7½-horsepower motor. The ingots are stripped from their molds and handled in and out of the soaking pit by a regulation pit crane.

A 35-inch, 3-high blooming mill is housed in a building 100 feet wide and 200 feet long which is adjacent to and interconnected with the soaking pit building. The mill-approach table extends beneath the pit crane, thus obviating the necessity of an ingot chariot for transferring the steel from the pits to the mill. Near the end of the approach table and at one side is a table upon which the ingots are deposited by the crane. This arrangement prevents the breakage of any part of the approach table in case an ingot should be dropped accidentally. A pusher, operated by a 12-horsepower motor moves the ingots broadside upon the mill approach

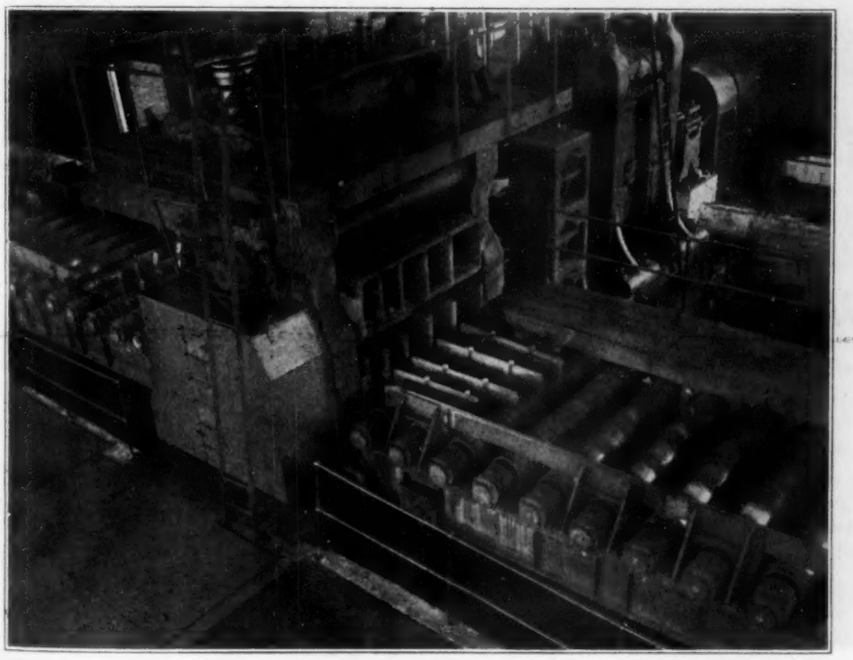


FIG. 9—DELIVERY SIDE OF THE 35-INCH BLOOMING MILL SHOWING THE FRONT AND REAR TILTING TABLES

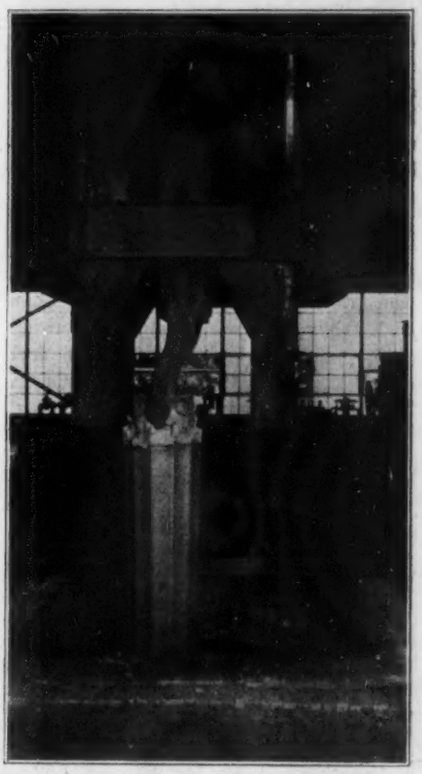


FIG. 10—STRIPPING CRANE REMOVING HOT INGOT FROM SOAKING PIT

FIG. 11—ONE OF THE VARIOUS INSPECTIONS GIVEN THE SEAMLESS TUBES DURING THE PROCESS OF REDUCTION IN THE HOT MILL

table. This table, which connects with the lifting table on the front side of the mill, is operated at a peripheral speed of 309 feet a minute, by a 20-horsepower motor. The three 36-inch rolls of the blooming mill are driven by a 1500-horsepower motor through a reduction gear set and a stand of 3-high pinions. The mill motor operates at 355 revolutions a minute and the rolls 35½ revolutions a minute. The rear tilting table is equipped with 13 rollers which are operated at a peripheral speed of 313 feet a minute by an 80-horsepower motor. The front table is served by vertical manipulating fingers. Both front and rear tables are equipped with Timken bearings.

Ingots are rolled into blooms 8 x 9, 7 x 7 and 6 x 7 inches. The rear lifting table of the mill delivers the finished bloom to the shear approach table. This latter table terminates in a motor-driven shear designed to cut blooms up to 10 x 10 inches. Two blooms 8 x 9 or 7 x 7 inches, are made from an ingot of 4250 pounds. The bloom shear has a 12-inch stroke and is operated by a 250-horsepower motor. After a cut is made the severed section rests upon the back-shear table which is of the depressed type. A kick-off, operated by a 12-horsepower motor, moves the bloom broadside from the back-shear table upon a parallel receiving table. The steel then is stamped with the specification and heat number so that the position of the bloom in the ingot can be identified in case future reference is necessary.

Certain grades of steel require slow cooling and for this purpose two annealing pits, each 16¼ feet long and 10 feet wide are provided at the rear of the blooming mill building. The steel is handled from the shear into the pit by a 15-ton overhead traveling crane. The steel is allowed to remain in these pits for a period ranging from 48 to 72 hours. It then is transferred on standard-gage cars to the shipping yard where it is pickled, chipped and the ends fractured to make certain that the steel is solid throughout. The blooms now are ready for further reduction on the 22-inch bar mill. This unit is housed in a building 100 feet wide and 965 feet long with a 10-foot leanto which also houses a seamless tube mill and a 10 and 12-inch merchant mill. This structure is in line with the blooming mill building and both can be tied together should a future expansion program warrant.

Blooms Handled by Magnet

The blooms are transferred from the shipping yard to the reheating furnace serving the 22-inch mill, by an overhead monorail crane from which is suspended a magnet. The blooms are charged into the furnace by a mechanical pusher and progress over the hearth which is 10 feet wide and 80 feet long. As each bloom reaches the discharge end of the furnace it is moved by a motor-driven extractor and is received by a traveling tilting table on the front side of the mill. The 22-inch mill includes four stands of 3-high rolls arranged in train. The rolls are rope-driven at 60 revolutions a minute by an 800-horsepower motor. The mill reduces the blooms to tube stock sizes in the form of round billets ranging from 2 to 7 inches diameter. Production of this mill also includes square billets of various dimensions suitable for merchant mill reduction. Frequently the 8 x 9-inch blooms are rolled on the 22-inch mill to billets 2 inches square and 140 feet long. Rolling into these lengths is facilitated by extension tables serving the tilting tables.

After the billets are reduced on this mill to specified dimensions, they

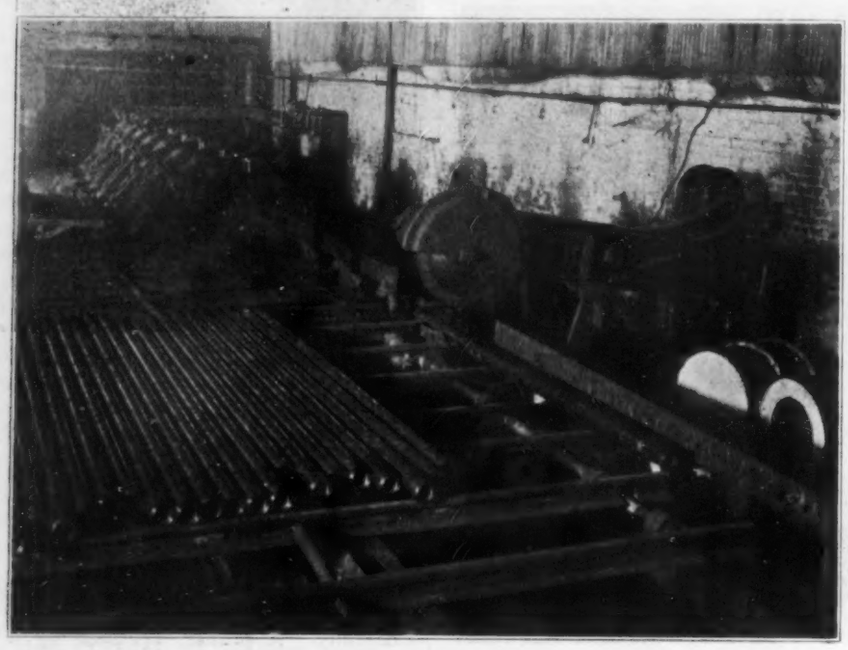
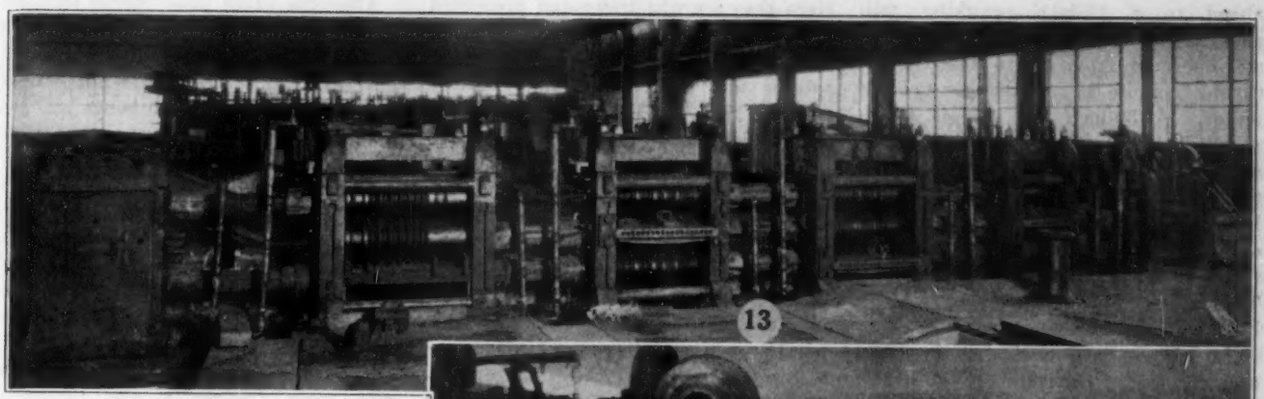
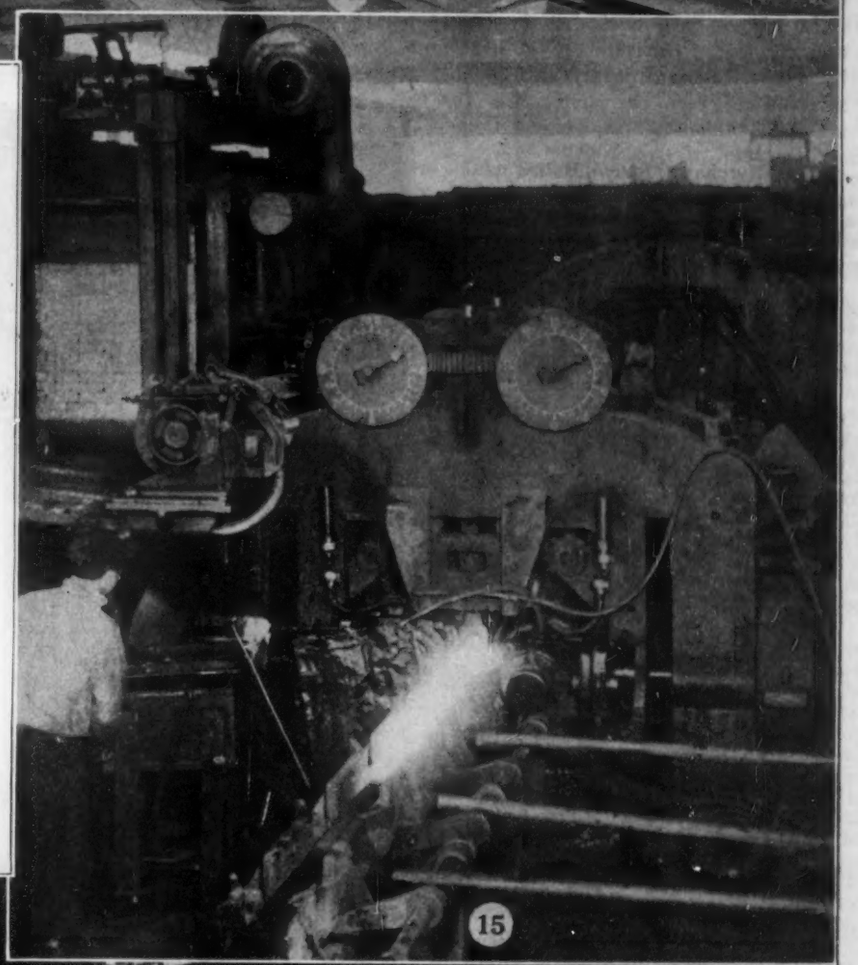


FIG. 12—IN THE DISTANCE IS THE CONTINUOUS REDUCING MILL. THE HOT SAW AND END-CUT TUBES ARE SHOWN IN THE FOREGROUND



are conveyed by a roller table to a hot saw installed along one side of the building. The long billet is sawed into multiple lengths, the cut sections being conveyed ahead a short distance and then transferred at right angles upon a table-type hot bed. Here they are inspected and if any surface defects are discovered, these are removed by rechipping. From here the billets either pass into the reheating furnace for piercing into tube stock or are conveyed down the line to the 10 and 12-inch merchant mills where they are rolled into rods, merchant bars or spring stock. The rods are used for roller rolls incorporated in the roller bearings and the merchant bars and spring stock is disposed to outside consumers.

A 17 x 40-foot heating furnace serves the 10 and 12-inch merchant mill. This unit is of the continous type and receives billets from the 22-inch mill. The heated billets are pushed out of the furnace mechanically and are received by a roller table which conveys them straight



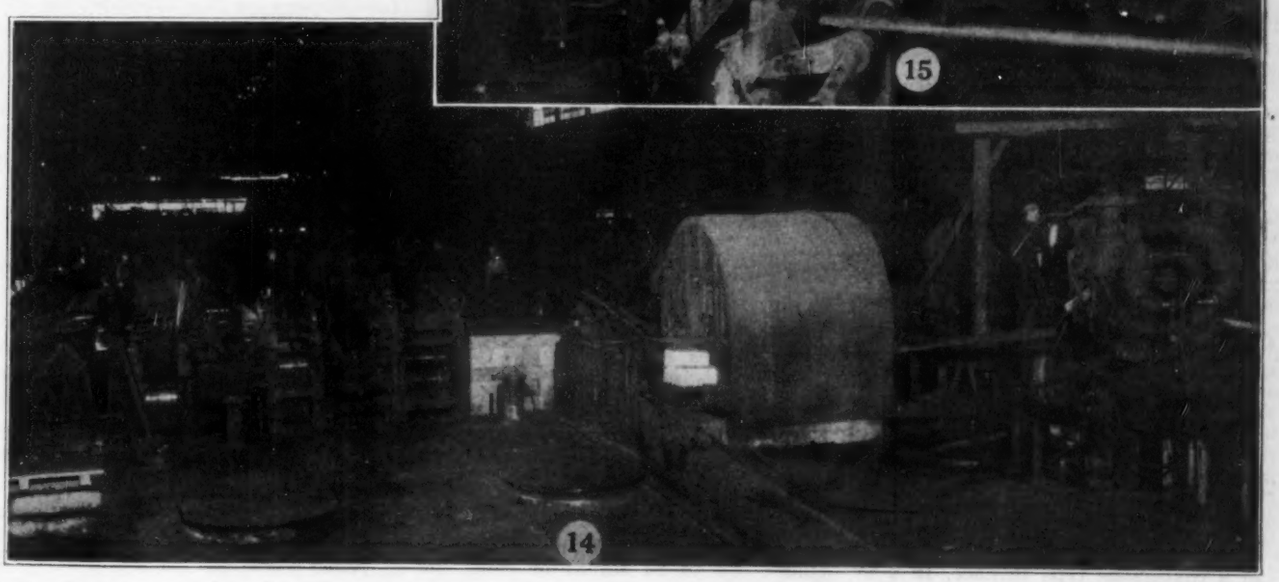


FIG. 13—FINISHING TRAIN OF THE 10 AND 12-INCH MILLS. FIG. 14—AT THE RIGHT IS THE 16-INCH ROUGHING MILL. THE 10 AND 12-INCH FINISHING MILLS ARE SHOWN IN LEFT CENTER. FIG. 15—PIERCING BILLETS INTO SEAMLESS TUBING INTENDED FOR CUPS AND CONES OF ROLLER BEARINGS

ahead to a 16-inch roughing mill equipped with 3-high rolls. The rolls are operated from 82 to 145 revolutions a minute by an 800-horsepower motor. A 30-inch hot saw is interposed between the heating furnace and the roughing mill for cutting the billets into suitable lengths. When broken down to the desired size on this mill, the billets are given further reduction on a 12-inch mill. This mill comprises five stands of 3-high rolls and one stand of 2-high rolls. These are arranged in train and are direct-driven by a 1200-horsepower motor. A flywheel is interposed between the motor and the stand of pinions.

Merchant Sizes Rolled

The stock is further reduced on the 10-inch finishing mill which is positioned between the heating furnace and the 12-inch train. The 3-high rolls included in the 10-inch train are direct-driven by a 400-horsepower motor. A hot bed, 120 feet long, serves both the 10 and 12-inch units. Rounds, 5/16-inch to 2⅛ inches or equivalent sizes of angles, flats, ovals and other shapes are produced by the merchant mills. When rods are scheduled on the 10-inch finishing mill, they leave the last pass through a pipe which directs them to a motor-driven reeling machine. This machine automatically discharges the coils upon a conveyor which, in turn, discharges them over a chute and into a bucket.

Rounds for tubemaking, ranging from 3½ to 7 inches diameter, are brought to the piercing temperature in a continuous type furnace, 10 x 60 feet. The hearth of this reheating unit is inclined so that the blanks roll by gravity to the extreme end. Here they are withdrawn and presented to the piercing mill. The piercing mill is of the Mannesman type and rotates and pulls the blanks over a plug. This causes a hole to be pierced through them longitudinally leaving a wall thickness ranging from ¼-inch to 1½ inches, depending upon the setup of the mill. Following the piercing operation, the tubes are inspected and then passed through a 22-inch, 2-high rerolling mill. During the rerolling process, the tube passes over an alloy steel plug. As a result of this process, the outside diameter of the tube is reduced and a uniform wall thickness obtained.

The tubes then are passed through a reeling machine and over a plug for the purpose of smoothing the outside and inside surface. Tubes with an outside diameter of 4⅜ inches and larger are then transferred to the cold-drawing department. Tubes smaller than 4⅜ inches outside diameter are conveyed to a reheating furnace, 22½ x 24 feet. The hearth of this furnace is inclined, the stock rolling to the discharge end by gravity. When at the proper temperature the tube is passed into a continuous reducing mill which includes one to 24 stands of rolls, the number of stands making up the train depending upon the diameter of tubes called for in the specifications.

After the tubes have passed through the reducing stands, they are sawed to the desired lengths. The outside diameter is reduced to the proper size for the cups and cones of the roller bearings by passing the tubes individually through a Brightman-type machine which gives them a rough and finishing cut rendering the surface smooth and bright. Following this treatment, the stock is inspected and then oiled and finally placed in a storage rack until ready for fabrication.

Tubes passing through the reducing mill train frequently are processed further by being cold-drawn. One end of the tube is swaged to a point under a steam hammer. The scale on the surface then is removed by pickling. After the material is washed and inspected, it is coated with a solution which serves as a lubricant for the dies in the cold-drawing machines. The cold drawing department is equipped with two 100,000-pound single draw benches and four 50,000-pound double draw benches. Stock, which requires more than one draw through the dies, is normalized in two gas-fired annealing furnaces of the car-bottom type. The cold-drawing department will produce stock from 5/8-inch to 6½ inches outside diameter and with a wall thickness ranging from 3/32-inch to 1½ inches. After the outside diameter is brought down to the size required, the tubes are passed through a straightening machine and then are cut to required lengths, again inspected, oiled and placed in storage.

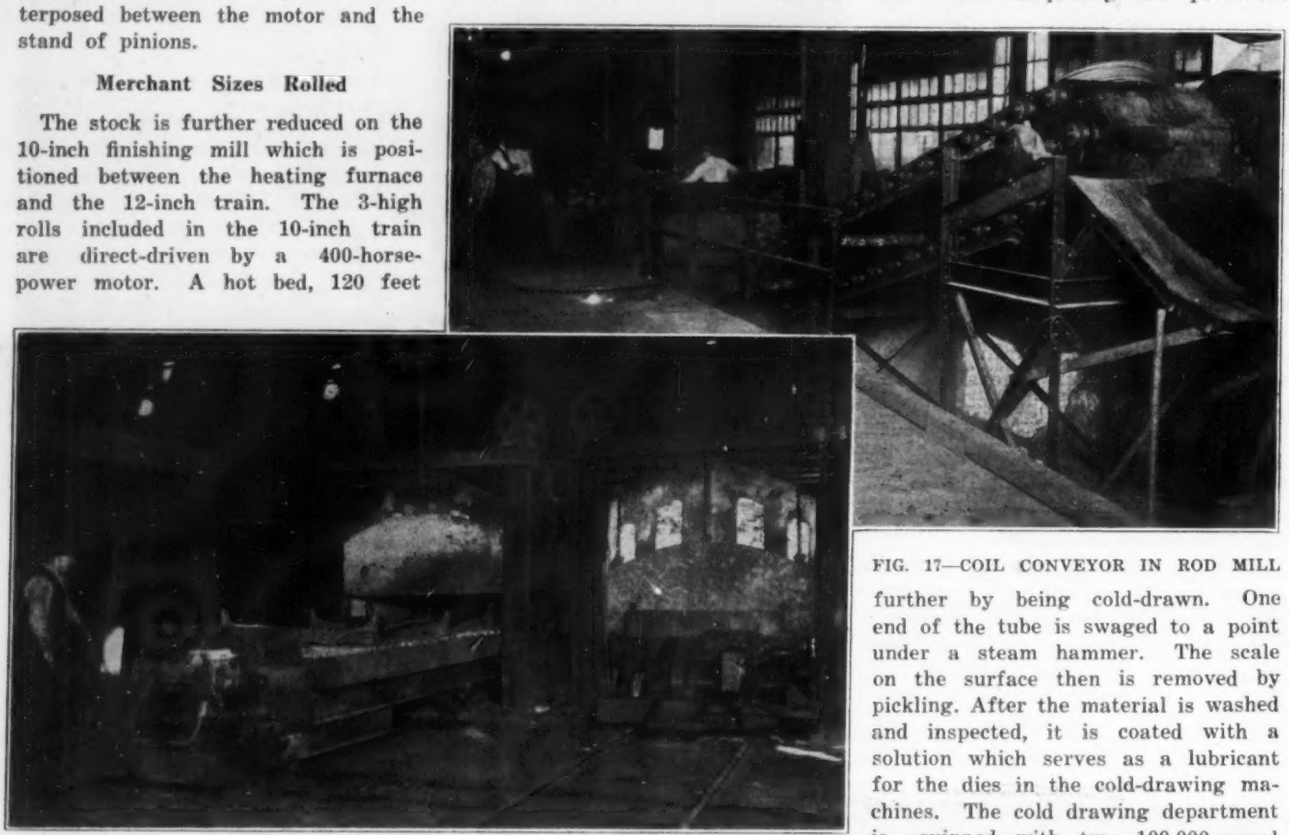


FIG. 16—ONE OF THE CAR-BOTTOM FURNACES IN WHICH TUBES, REQUIRING MORE THAN ONE DRAW THROUGH THE DIES, ARE NORMALIZED

FIG. 17—COIL CONVEYOR IN ROD MILL

Involves Four Parts

Roller bearings manufactured by the Timken company include four separate parts. Namely, the cone, the roller, the cage in which the rollers

are spaced about the cone and the cup which fits over the rollers and cone. The cone and cup are made from seamless tubes; the taper rollers from merchant bars or rods depending upon the diameter; and the cage from strip steel. Approximately 297,000 cups and cones are fabricated a day by the 700 automatic machines operated by the company. These particular parts of the bearings are packed in bone meal and carbonized at 1700 degrees Fahr. for various periods depending upon the depth of case desired. They then are subjected to additional hardening processes and finally are ground to the specified dimensions. Approximately 1000 grinding machines are used for this purpose. The precision of grinding, the accuracy of the angles of each cone, cup and roll are closely guarded. An interesting machine known as the audion sound testing machine has been developed by the company. This unit measures the sound by a microphone and registers it on a dial. Detection of a noisy bearing leads to its rejection.

Multiple Machines Employed

Until recently the cage pockets were punched separately. However, the metal crept slightly causing a variation in the first and last pocket. Recently, however, multiple perforating machines which punch out all the cage pockets simultaneously were developed. By pressing the side of the cage pockets to a contour identical with the contour of the rollers an accurate fit is obtained.

A ground area of nearly 35 acres is covered by the Canton O. plant of the company. As a consumer of power, the Timken company ranks with the largest industrial users. Various machines used in the production of roller bearings require for their operation approximately 1000 electric motors of various horsepower. An average of 5,000,000 kilowatt hours are required each month for the plant operations. Cutting, cooling, lubricating and fuel oil consumed in a year amounts to 2,500,000 gallons. Approximately 3,000,000 gallons of water pumped from wells on the company's property are consumed daily. Two distinct engineering staffs are maintained. One devotes its entire time to plant engineering, that is, new processes and new machines and labor-saving devices. The second engineering group devotes its time to the application of roller bearings to all types of industrial machines, motor cars, trucks, tractors, machine tools, car dumpers, cranes, etc.

Steel Containers Speed Freight Deliveries

Further co-ordination of motor truck and freight train service by use of steel freight containers interchangeable between truck and train has been achieved by the Boston & Maine railroad between Boston, Worcester and Springfield, Mass. The railroad, through its motor subsidiary, the Boston & Maine Transportation Co. has inaugurated a store-door delivery service. The containers, of 5 ton capacity, may be loaded inside a shipper's factory in Boston, locked securely, transferred by truck at any time before 6:30 p. m. to specially equipped cars on the Boston & Maine, and carried by train to Worcester and Springfield in time for delivery before the next business day. Overnight shipments will also be handled from Worcester and Springfield to Boston.

Holds Sales Conference

More than 100 representatives of the VanCamp Hardware & Iron Co., Indianapolis, machinery and hardware jobbers, covering Indiana, Ohio, Michigan, Illinois, Tennessee, West Virginia and Alabama attended the recent annual sales convention of the company held at Indianapolis. Clifford B. Crets, vice president and general sales manager, presided at the convention. He said the past year had been satisfactory and marked the close of the company's fiftieth year. New merchandise and methods were discussed at the meeting.

Mexicans Produce Ferro

Ferromanganese of the 80 per cent grade was made successfully during December in the stack of the Compania Fundidora de Fierro y Acero de Monterrey, S. A. (Monterrey Iron & Steel Co.) Monterrey, N. L., Mexico, according to D. J. Felkel, superintendent blast furnace department. All raw materials used in its manufacture were obtained in Mexico. The manganese ore was mined in the states of Durango, San Luis Potosi and Chihuahua.

Plan Foundry Course

A 4-day short course of intensive instruction organized especially for foundry superintendents, managers, foremen, molders, chemists, metallurgists and other persons actively engaged or interested in problems of the foundry has been arranged by the college of engineering, University of Wisconsin. Dates established for the course are Feb. 1-4, and the registration fee will be $10. Communication should be addressed to Prof. E. R. Shorey, University of Wisconsin, Madison, Wis.

War's Effect on Export Trade Still Severe

"Though the world imagines that the United States profited most by the world war, our export trade is $2,000,000,000 short of what it would have been had there been no war," says the National Foreign Trade council, in a recent analysis of world trade.

"The world has fallen short by more than $210,000,000,000 of the total of the merchandise exports it would have added to international trade if it had not been for the economic dislocation that accompanied and followed the war.

"Complete figures for 1925 for the nations who do more than 90 per cent of the world's export trade shows that now for the first time since the war international exports are at par again. These 72 nations had an export trade in 1913 valued at $19,466,300,000. In 1926 the corresponding figure stood at $20.118,000,000, after reducing the $30,215,200,000 worth of trade actually reported to the 1913 buying power of the dollar. Since 1913 it has thus taken 12 years to bring a 3.4 per cent increase in the actual value of exports circulating in the world.

"What world trade would have been had there been no war may be judged by the rate of advance in export trade that steadily progressed from 1900 to 1913. During those years, allowing for the inflation of gold, the annual growth in world exports was a little over 6 per cent. Had this growth continued the world would have been doing $41,500,000,000 of export trade at 1913 values instead of $19,950,000,000, the actual figures. At 1925 dollar values it would have done $62,100,000,000 instead of just over $30,000.000,000, the actual figures.

"The accumulated shortages of these 12 years amount to $210,000,000,000 at 1925 gold values, ten times our national debt, or $140,000,000,000 at 1913 values.

"World trade has now accelerated its pace to fill this gap. Instead of a 6 per cent increase, world exports have been gaining more than 10 per cent annually for the past three years. The world will have to increase its exports at this rate yearly for more than 30 years to make up for the ground lost during the war. The United States gained almost 32 per cent in real exports since 1913 and has made the greatest gain of all nations in volume of trade acquired but still is more than $2,000,000,000 behind the export trade it would have had if the prewar gain had been uninterrupted."

Bryan Steam Products Inc., of Indianapolis, has increased its capital stock from $15,000 to $30,000.

Cites Steel Casting Defects

Poorly Designed Patterns, Improper Heading and Gating, Warped Flasks and Unsuitable Sand All Help to Produce Defective Steel Castings and Raise Foundry Costs

By R. S. Munson

DEFECTS in steel castings considered in this paper are not only those serious enough to cause scrapping of the casting, but also minor defects which can be repaired satisfactorily, though at an added cost. This problem of defects is an ever-present one with each steel foundryman, and together with cost and deliveries, both of which it affects vitally, are the daily bane of his existence.

Theoretically, if one perfect casting can be made from a pattern it should be possible to make any number of perfect castings from the same pattern. How difficult to achievement this is, is borne out by the daily experience of any steel foundry. Castings made from the one pattern by the same molder at the same time, and poured from the same heat, will show varying individual defects often hard for the foundryman to explain.

A few years ago an article by Michael R. Burns appeared in *The Foundry*, entitled "Fifty Causes of Defects in the Foundry." In this paper the author enumerated in detail fifty causes of defects. He stated further that, in view of the almost innumerable possibilities of defects in a casting, the wonder is not that there are so many defective castings, but rather that the percentage of good castings is as high as it is.

Remedies May Differ

It is not the purpose of this paper to enumerate all the defects which do or may occur to steel castings in the foundry, nor to attempt to offer remedies for each individual defect, for these remedies may differ as much, according to the individual judgment of different foundrymen, as the defects themselves.

For example, a shrinkage crack in a casting may be remedied by the changing size or location of heads, using brackets or cracking strips or by the use of inside or outside chills, any one of which may solve the trouble. The method used depends entirely on the judgment of the foundry foreman.

Speaking generally, however, the causes of defects in steel castings in the foundry can be placed under three main heads:

1. Design and pattern equipment.
2. Molding and core shop methods.
3. Melting and pouring conditions.

These causes are mentioned in their sequence in the cycle of operations, and will be considered in that order.

In the matter of design, especially in the jobbing foundry, the steel foundryman is often the unwilling and unhappy victim, since most of the castings he makes are designed by his customers, and in many cases the engineer in his effort to limit weight or decrease assembly costs designs a casting not consistent with good steel foundry practice. Most steel foundrymen could cite instances from their own experience where, after suffering heavy losses in the foundry from castings of this character, they have made changes in the original design, in order to conform to good steel foundry practice, by which they have been able to produce satisfactory castings without great loss from defects. This of course, does not apply to experimental work, where the customer is trying to develop a design with the assistance of the foundry, but rather to the regular run of work which the steel foundry concerned has taken at a fixed price and on which they expect to make a profit. Nor does it apply to the foundry making specialties of their own design where the engineer has taken steel foundry problems into consideration.

In order to reduce the defects from this cause the steel foundry should insist that its customer's engineers consult with them as to castings of new or intricate design. By doing this it is possible to work out the problems beforehand satisfactorily and save losses to the foundry and vexatious delays to the customers.

A somewhat similar condition prevails with pattern equipment, as in most cases this, too, is furnished by the customer without consultation with the foundry concerned as to the most suitable method of construction. A solid pattern may be furnished when a split pattern would be preferable, or the split pattern furnished may be parted wrongly. Core boxes may be furnished when it would be better for the pattern to make its own cores, or the reverse may be the case. Blueprints may not be furnished so patterns can be checked for shrinkage, nor are patterns always marked to show finish.

The physical condition of the patterns may be such that they will not last for the order, and so cause defective castings. This question has been treated very ably in detail by W. J. Gilmore in a paper entitled "Pattern Expense from the Jobbing Foundry Point of View," presented before the Steel Founders' Society of America in July of this year. In this paper the author showed clearly and definitely the losses to the steel foundry from poor pattern equipment furnished by customers and accepted by the foundry.

Recommends Standard Patterns

If all customers could be convinced of the advantages to themselves, as well as to the steel foundries, of constructing their patterns in accordance with the standard method sponsored by the American Foundrymen's association, the Steel Founders' Society of America and other foundry organizations, many of the difficulties mentioned would be overcome. To accomplish this it is necessary for the foundries to co-operate whole-heartedly in educating customers along these lines.

Too often in anxiety to secure an order the question of design and proper pattern equipment will be overlooked and the foundry securing this order finds itself facing the problem of producing castings of impracticable design from poor pattern equipment without sustaining severe losses from defects due to either or both of these causes.

When a pattern of proper design and construction is ready for production the first problem of the foundry and core shop foremen in securing a satisfactory casting is that of proper heading and gating. This calls for their best judgment, as from this point on each casting becomes an individual problem and any mistakes in heading and gating will cause similar defects in each casting, in

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From a paper presented at the annual convention of the American Foundrymen's association, Detroit, Sept. 27 to Oct. 1, 1926. The author, R. S. Munson, is vice president, Atlantic Steel Castings Co., Chester, Pa.

addition to whatever individual defects they may fall heir.

If heads are too small shrinkage will develop, if too large metal is wasted and the large head may crack the casting. If not properly gated, scabby, misrun or cracked castings may result. As this is so much a matter of individual judgment on the part of the foreman, and, as his judgment is based largely on his previous experiences with castings of similar design, it would seem advisable to help him by keeping a careful record of previous methods, both satisfactory and unsatisfactory, rather than forcing him to rely entirely on his own memory. With the benefit of this previous experience definitely placed before him he is in much better position to avoid defects in the castings arising from mistakes.

It seems unnecessary to mention the need for good flask equipment, but due to the hard usage to which flasks are subjected in a steel foundry, particularly those flasks used for dry sand, it is not unusual to find flasks in such condition that they are the cause of various defects in the castings. Warped flasks with bad joints and poor pinholes may be seen in daily use, resulting in shifted, crushed or heavily finned castings.

With proper pattern equipment to place in suitable flasks, the next problem for the foremen is that of a proper molding and core sand. Each steel foundry, no doubt, uses the most suitable sands and clays for their class of work which are obtainable in their particular locality. It is essential, however, that this sand be conditioned properly both for use in molds and cores, with particular reference to the character of the castings to be made. Which is the best sand or combination of sands to be used, can be decided only by results obtained. Once this is determined the sand should be kept to these standards, not only from day to day, but from hour to hour in order to insure the uniformity desired. This can best be done by laboratory equipment, for the old method of testing by the "feel" will cause too wide variations. The moisture content, permeability and strength of the sand should carefully be determined. This will vary of course, depending on whether the sand is used for green sand or dry sand molds, also on the size of the casting to be made. A green sand too wet or too close will cause blowy or scabby castings, one too dry, dirty castings. A dry sand too wet will cause cracked molds in drying, with the possibility of dirty castings. A sand too strong will make too hard a mold, which will crack the casting; one too weak will result in crushed or dirty castings.

In dry sand work burned molds or molds not thoroughly dried also will cause some of the defects mentioned. Considering the great number of defects in steel castings, which are traceable directly to poor sand conditions, it is evident that a great deal can be done in the way of improvement of conditions along these lines.

While the sand committees of the American Foundrymen's association have done valuable work in sand investigation, it would be possible for individual foundries in adjoining localities using the same source of supply to extend this work with great practical benefit to themselves. By co-operating more closely in determining the best sands available, and also the best methods of conditioning them they should be able to materially reduce defects from sand conditions. It would seem that there are great possibilities for further research.

Proper Methods in Molding

With the use of the best equipment and raw materials the foundry foreman and core shop foreman still face the task of properly making molds and cores so that when closed and poured the resulting castings will be satisfactory. This largely becomes a problem of workmanship, such as proper ramming, nailing and venting of molds and cores. As each casting is individual so is each workman, and the individual casting tends to reflect the efforts which the individual workman puts into it.

In spite of the prevalence of machine production, there is still a great need for skilled workmen. In every shop there are always certain outstanding workmen whose product is superior to that of their fellow workmen, as shown by the small number of defective castings coming from their floor. And perhaps the defective castings in a steel foundry reflect more accurately than is thought the character of the personnel of that foundry. If this be true all efforts along the line of improving the character of the personnel would be amply repaid. A good example of what can be accomplished along these lines is illustrated by the results obtained by the Milwaukee group of steel foundries with their apprentice system.

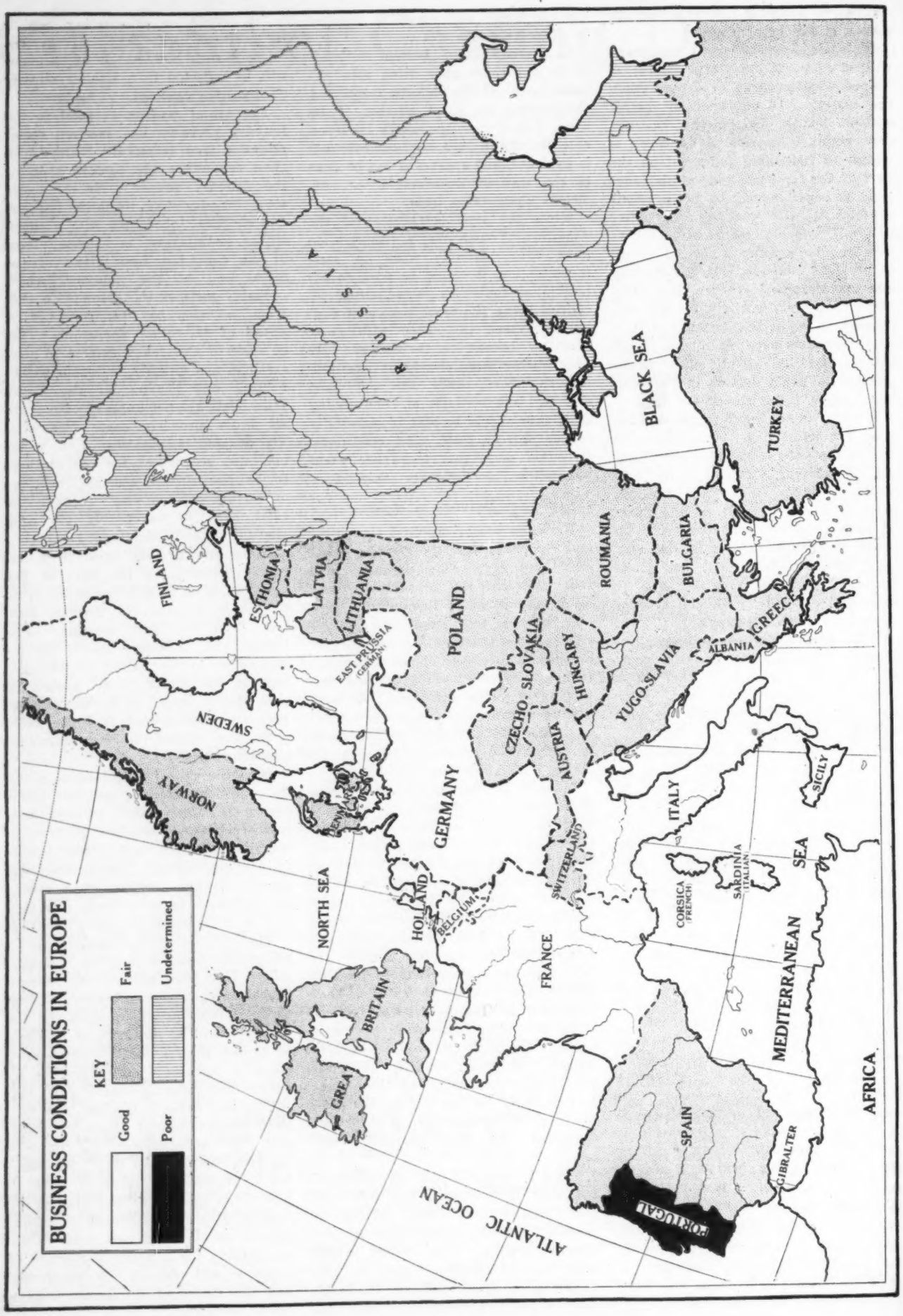
There is no doubt that this group of foundries is benefiting and will further benefit from their efforts in properly training young men for the foundry trades. This subject, which only can be touched upon in this paper, is a great problem in itself, and we are at present only concerned in its effect on eliminating defects in steel castings. Any improvement in personnel, however, brought about will be reflected in a smaller number of defective castings.

The actual making of steel in the foundry probably has received closer attention from technically trained men than has either the pattern shop or the foundry proper. Nearly every steel foundry has its own physical and chemical laboratory with a chemist or metallurgist in charge. Most of his time has been given to the metal end of the industry, which probably justifies the assumption that from a scientific standpoint it is ahead of the other operations. Yet in spite of this many defects in steel castings are directly traceable to the melting and pouring of the metal. Wild heats are not unheard of nor are all heats properly made otherwise. The pouring temperature of the metal may not be correct for the castings to be poured. If too hot, castings of certain designs may crack or the sand burn in badly. If too cold, misrun or dirty castings result.

Other defects may arise from improper pouring on the part of the ladlemen, such as strained molds from too rapid pouring, or misrun castings from too slow pouring. The melter and ladlemen should be informed as to the nature of the castings in the molds to be poured so that metal is tapped at the proper temperature and poured into the mold with due regard to its individual characteristics.

It is the proper combination of all the conditions affecting patterns, molds and metal that makes possible castings free from defects. Failure in any one of them will cause defects of varying degree. The number and extent of these defects often means the difference between profit and loss, and is a problem of every foundry.

The solution of this problem is an important task of foundry management, and like many other human problems can be more easily solved through co-operation in educating the customer to the necessity of castings of proper design, and pattern equipment of suitable construction; in securing the best available raw materials and determining the best possible combination of these materials, and in endeavoring to improve the personnel of their plants by training apprentices in research work to better the quality of the product by improving present methods of manufacture or devising new ones. Only by striving for ultimate perfection of product will defects be eliminated and the status of the industry as a whole advanced.


BUSINESS CONDITIONS IN EUROPE
KEY
Good
Fair
Poor
Undetermined
RUSSIA
BLACK SEA
TURKEY
FINLAND
ESTHONIA
LATVIA
LITHUANIA
POLAND
ROUMANIA
BULGARIA
GREECE
EAST PRUSSIA (GERMAN)
CZECHO-SLOVAKIA
HUNGARY
YUGO-SLAVIA
ALBANIA
SWEDEN
NORWAY
DENMARK
GERMANY
AUSTRIA
SWITZERLAND
ITALY
SICILY
SARDINIA (ITALIAN)
CORSICA (FRENCH)
NORTH SEA
HOLLAND
BELGIUM
FRANCE
BRITAIN
GREA
SPAIN
PORTUGAL
GIBRALTER
MEDITERRANEAN SEA
AFRICA
ATLANTIC OCEAN

Europe Struggles for Stability

Leading Industrial Nations Abroad Have Taken Decisive Step Toward Economic Co-operation—Germany Benefits From Britain's Prostration by Coal Strike—France Improving Finances

By Vincent Delport
European Manager, Iron Trade Review

Business Conditions in Europe

Norway .....Fair	Holland .....Fair to good	Austria .....Poor to fair
Sweden .....Fair to good	Great Britain.....Fair	Hungary .....Poor to fair
Finland .....Good	Belgium .....Fair to good	Rumania .....Poor to fair
Esthonia .....Fair	France .....Fair to good	Yugo-Slavia.. Poor to fair
Latvia .....Fair	Spain .....Poor to fair	Albania .....Poor to fair
Lithuania .....Fair	Portugal .....Poor	Bulgaria .....Poor to fair
Poland .....Poor to fair	Italy .....Fair to good	Greece .....Poor to fair
Germany .....Fair to good	Switzerland ....Poor to fair	Turkey .....Fair
Denmark .....Poor to fair	Czecho-Slovakia .....Poor to fair	Russia .....Undetermined

THE passing of 1926 leaves Europe still struggling with many economic problems of considerable importance, but seriously trying, by combined effort, to regain some measure of stability. One point that should not be lost sight of and which was particularly illustrated during the latter part of the year is that the leading industrial nations of Europe have taken a decisive step in the direction of co-operation.

Special reference is here made to meetings which have taken place between the more prominent businessmen of these countries. Such contacts are becoming more and more frequent and the conversations cover a wide field, exploring every direction in which practical co-operation can be obtained. The time is not yet ripe when the tariff walls which now encircle the various countries of Europe can be pulled down, but the feeling is gaining ground that the way to prosperity will be more quickly attained by co-operation than by crude methods of competition.

The conditions of the iron and steel industries of the principal countries of Europe are shown in the special reports which will be published in the statistical issue of IRON TRADE REVIEW. In this article it is attempted to show how these steel-producing countries stand at the beginning of the new year, and what prospects they can reasonably be expected to anticipate. The situation in Great Britain has been the dominating factor in western Europe during recent months.

Half a year's interruption of coal mining in a country which depends on coal not only for the operation of its own industries but also to a large extent for the major part of its export business is a calamity that only a strong nation can withstand. A loss of nearly £100,000,000 ($485,000,000) in the value of exports in the ten months ended October, 1926, as compared with the corresponding period of 1925, is only one of the more visible signs of the effects of the coal stoppage. The direct and indirect losses to the country amount to several times that figure, and the industries, particularly coal mining, iron and steel and shipbuilding, are shouldering the heaviest portion of the load. For the first ten months of 1926 pig iron production decreased by 2,907,000 tons, steel production by 2,993,100 tons; the drop in iron and steel exports was 400,143 tons, while imports increased by 541,189 tons. These figures are eloquent by themselves.

Producing Costs High

An interesting light is thrown on the financial burden of the British industries by a plea addressed by the Federation of British Industries to the prime minister. It is stated that the task of British manufacturers of reducing their costs of production in order to be able to meet competition from foreign nations in the markets of the world is one of surpassing difficulty. According to the federation's view, these difficulties have been increased by the return to the gold standard as opposed to the policy pursued by the governments and financial authorities of competing continental nations.

The decision of the British government to return to a gold standard was made at a time when the bulk of prices in Britain had not yet been reduced to a competitive level, and this in itself increased the difficulties under which British industry already was laboring. It is further pointed out that the total contributions by employers and workers to the three national insurance schemes during the current year amount to no less than £87,500,000 ($425,000,000), a large portion of which sum has to be found by industry. One result of the coal dispute is bound to be a serious increase in local taxation for poor relief, this falling directly upon industrial ratepayers as additional costs of production, since assessments are made irrespective as to whether an industrial concern is making a profit or a loss.

These difficulties are real. Yet no sooner has the coal dispute come to an end than the industries are preparing to go full steam ahead. A large number of orders and contracts, some of which are of considerable importance, were collected during the last weeks of the stoppage. These contracts are more especially for engineering work and shipbuilding. As was to be expected, domestic requirements have long been held up and they now make up the bulk of the work which will enable plants and shipyards to resume activities to even a greater extent than before the stoppage. However, it is inter-

esting to note that a substantial tonnage of orders in engineering and shipbuilding has been taken for foreign markets, with the result that Britain has a fair prospect of regaining at least part of its lost export trade before very long.

British coal even already is required by foreign customers such as the French railroads, since Welsh coal is recognized as being the best for certain requirements. What may turn out to be a good result of the stoppage is that it has brought home the fact that the scrapping of obsolete plant and more efficient organizations are essential factors to lower production costs. These factors are vital to British manufacturers who can only hope to regain their prevalence in export business by maintaining the quality of their products and by arriving at prices which can enable them to compete against continental producers. In the meantime, business conditions in Great Britain can no longer be considered as poor.

Belgian Franc Stabilized

The stabilization of the Belgian franc is another event of prime importance which occurred toward the end of the year. This is Belgium's second attempt, but this time it appears to be successful. The effects on the iron and steel industry are masked by the impetus afforded these industries by the coal stoppage. However, the rate at which the franc is stabilized probably was chosen with the object of causing the least possible contraction to export business, and the future is viewed with a certain amount of optimism. The economic program which the government has set itself to follow contains several points related to the heavy industries, particularly the expansion of coal mining in the districts of Campine and South Belgium, the improving and developing of the port of Antwerp, the grouping of industrial production and the modernizing of plant with a view to intensifying output. It is further intended to encourage export business by every possible means and to develop the Belgian colony of Congo. At the end of the year Belgian blast furnaces were practically operating to capacity.

Iron and steel production in France has increased to such an extent that this country now enjoys the second rank, after Germany, among the countries of Europe. At the end of the year production still was on the increase. French exports of iron and steel, however, have not developed in proportion. The financial policy of the government is more particularly directed toward revalorization than toward the stabilization of the franc. If the appreciation of the franc exceeds certain limits there is bound to be a slowing down of industrial and commercial activities and a stringency of money which will be acutely felt in the iron and steel industries, where a considerable amount of capital is involved and where production must continue intense in order to be profitable.

Germany ended the year 1926 with her iron and steel industries booked well into the first quarter of the new year. From July to November the output of both pig iron and steel consistently increased month by month, each time creating a new record. Exports of iron and steel during the year exceeded 4,500,000 tons, the highest figure since 1913. The improvement from one end of the year to the other is remarkable and is due to rational organization. The satisfactory results obtained by the amalgamation of the Westphalian iron and steel concerns into the United Steel Works Co. has caused similar mergers to be made, although on a smaller scale, in Upper Silesia and central Germany. Only a few large independent firms remain. Of these Krupp is said to be the least flourishing and operating on a considerably smaller scale than a year ago.

One successful independent firm is the Kloeckner Werker. At the recent annual meeting of the stockholders, held Nov. 26, Herr Peter Kloeckner, the chairman, analyzed Germany's present economic position. Although Herr Kloeckner's views are perhaps on the optimistic side, his prominent position in the industrial world lends weight to his words. He stated that at the beginning of the British stoppage the German collieries were operating at only 55 per cent and the coke ovens at 65 per cent capacity. Since then production has become massive, as the coal syndicate wisely kept prices down and intensified output. As a result, the enormous stocks which had accumulated were rapidly reduced. Germany has not only regained export markets which had been lost in the past, but has also conquered new ones.

According to Herr Kloeckner, it is not expected that the end of the British strike will cause the coal market to slump because considerable requirements for 1927 have not yet been taken care of and the demand remains substantial. At the end of November the German coal mines were producing at the rate of 85 per cent of the quotas of production, and it was expected to reach 90 per cent by the end of the year. On the pig iron market the demand exceeds 100 per cent of the quota of production. In conclusion Herr Kloeckner said that the effects of the British coal stoppage should continue to be felt for some time to come and he expects the year 1927 to be prosperous for Germany.

Italian industries are handicapped by a shortage of coal, and several steel furnaces have been closed down. This results in orders for finished steel products, principally ship plates, being passed to foreign mills, notwithstanding the Italian protective tariff of 75 lira ($3.20) per ton. The prestablization measures now being undertaken in Italy are causing a slowing down of the mechanical industries. The automobile industry especially is hit in view of the intensity of American and French competition, and prices are being forced down. The larger shipyards have sufficient orders on hand, and manufacturers of agricultural machines are developing their business. In Poland the economic position is improving; unemployment figures have fallen off. The trade balance has turned in favor of Poland and the coal industry has been satisfactory since the British stoppage. However, iron and steel production in 1926 did not show any marked advance on that of the previous year.

Depression Still Exists

The Swedish iron and steel industries continue depressed. Although sales have increased in volume, prices have not improved, and production for the year has only increased about 8 per cent for pig iron and 4 per cent for steel in comparison with 1925. One bright spot is the prospect of labor peace for 1927, due to the fact that existing agreements have been prolonged into the coming year. In Spain the effects of the high protection of the metallurgical industry have resulted in an increase of production and a decrease of imports. The output of iron and steel in Hungary and Rumania during the past year has been on the increase. Negotiations for the inclusion of these countries, together with Czecho-Slovakia and Austria, in the continental steel entente are being continued and should eventually bring about the desired object. There still are, however, a number of concerns which are holding out for larger quotas than can be distributed.

Large Uses of Steel In Small Ways

OFFICE furniture and appliances offer a constantly increasing outlet for iron and steel products. It is not uncommon to find modern offices with all furniture of sheet steel construction, and ingenious appliances of various sorts, for the most part of steel, are being introduced to simplify business operations.

One such appliance, which was brought out three or four years ago, is a telephone index. This consists of a box made of strip steel stampings carrying two rollers or spools, on which a long strip of paper is wound. This paper may be readily removed and placed in a typewriter so that addresses may be written on it. The spools are driven by gears in such a way that as the paper is wound on to one, it is at the same time wound off of the other.

A standard size telephone index measures 3¼ inches by 4¼ inches, and the box, which is made entirely of steel stampings, weighs 1.12 pounds. To make this box 1.5 pounds of strip steel are required.

The gears are also made of stampings and these weigh 72 pounds for a thousand complete indices. These gears are blanked, repunched, cleaned and then given a special rustproofing treatment. Most of the parts are made of low carbon strip steel, but the small gears and a few other parts are made of high carbon steel.

The paper roll is held in place by small strips of spring steel fastened to the wooden portion of each spool. One of the chief features of the index is its smooth operation, so that a slight turn on the knurled knob at the right is sufficient to carry the rotation of the spools throughout the full length of the strip of paper. To obtain this smooth action, precision work in construction is necessary. Carefully and accurately made dies are used in stamping out the gears. Many inspections are called for on each part as it goes through the sequence of operations in the factory.

The lid of the box, which is a strip steel stamping formed complete in one operation is held in place by a spring steel catch which is riveted on.

Nearly half a million of these indices have been sold during the past four years, and the consumption of steel for this one article at present runs well above 100 tons a year.

Telephone Indices

THIS is the eightieth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the great American tonnage.

The first article on "corsets" appeared Nov. 22, 1923. Vol. I of "Large Uses of Steel in Small Ways" containing the first and 50 other articles has just been published. Copies are available from Penton Publishing Co. at $1. Other articles appearing every two weeks and not included in Vol. I are:

Tie Plates	*Camp Stoves*
Tacks	*Bottle Caps*
Knives and Forks	*Artificial Limbs*
Fence Posts	*Finger Nail Files*
Dental Drills	*Pencil Lead Boxes*
Rat Guards	*Small Steel Cases*
Overall Trimmings	*Lace Tips*
Shoe Steel	*Oil Cups*
Skates	*Ventilators*
Golf Clubs	*Toy Autos*
Burial Caskets	*Safes*
Flexible Shaft	*Scissors—Shears*
Steel Derricks	*Pistols*
Handle Cores	*Milk, Ice Cream Cans*
Typewriters	

Points Out Qualities of Wrought Iron

"A bessemer furnace is a gigantic big bellied, roaring caldron in which, under high pressure of driven air, 15 tons of pig iron brought in liquid form direct from blast furnaces, is refined in 15 minutes," said A. A. Gatheman, district sales manager at Boston for A. M. Byers Co., in a recent talk on wrought iron before the Engineer's club at Providence, R. I. In marked contrast is the charge in a puddling furnace which averages 560 pounds.

The speaker gave an illustrated description of the present method of producing wrought iron. He told of the puddlers, each in his turn, carrying his dripping ball of metal to the squeezer and rolls where the balls are gradually squeezed and flattened out into muck-bars. Mr. Gatheman compared the qualities of wrought iron with those of steel. "Good wrought iron," he said, "better answers the needs of effective and enduring welding than steel. It has better threading qualities and resists vibration and fatigue to better advantage. Finally, and most important, it has a greater capacity for resisting rust, and in that fact alone lies the reason why wrought iron today survives."

MOTOR-DRIVEN PUNCH PRESS FOR PUNCHING THE BOX SECTIONS

Gage Committee Meets

Members of the gage steel committee met at the bureau of standards Dec. 6, to discuss progress of the tests to date and to lay plans for continuance of the research. Representatives of the bureau, H. J. French and H. W. Bearce, explained that while there are no funds specifically set aside in either the division of metallurgy or division of weights and measures for this work, it is thought that with the continued co-

operation of steel manufacturers, gage makers and gage users, the work on wear resistance can be carried through to completion, at least for the materials and heat treatments so far studied. The next meeting of the committee will be held at the bureau in February, 1927, the exact date to be left to the secretary, H. W. Bearce.

Metals Withstand Heat

Marked progress in the development of metals to withstand extremely high temperatures and pressures has been made during the past year by the Chapman Valve Mfg. Co., Springfield, Mass., according to a recent report of the metallurgical laboratory of that company. This laboratory was started in 1921 as a means for controlling foundry practice, but it soon developed into a research laboratory extending its studies into many technical fields. At present, the research laboratory is under the direction of V. T. Malcolm, chief metallurgical engineer. In co-operation with the national engineering societies this laboratory has developed metals which withstand pressures as high as 600 pounds to the square inch and temperatures exceeding 1000 degrees Fahr.

Steel Treaters Announce Officers Elected

The American Society for Steel Treating announces the report of the tellers of election for officers of the society for 1927. All candidates nominated at the September convention in Chicago were declared elected. The new officers are as follows: President, J. Fletcher Harper, Allis-Chalmers Mfg. Co., Milwaukee, one year; vice president, F. G. Hughes, New Departure Mfg. Co., Bristol, Mass., one year; secretary, W. H. Eisenman, 4600 Prospect avenue, Cleveland, two years; directors, L. D. Hawkridge, Hawkridge Bros. Co., Boston, and J. H. Nead, American Rolling Mill Co., Middletown, O., two years.

These officers, in addition to R. M. Bird, George F. Pettinos, Philadelphia, past president, Zay Jeffries, Aluminum Co. of America, Cleveland, treasurer; Hyman Bornstein, Deere & Co., Moline, Ill., director and R. G. Guthrie, Peoples Gas Light & Coke Co., Chicago, director, will constitute the officers for the coming year.

Review of New Books

Welding by Electric Arc

Arc Welding; imitation leather, 160 pages, 6 x 9 inches; published by the Lincoln Electric Co., Cleveland and supplied by IRON TRADE REVIEW at $1.50 net and in Europe by Penton Publishing Co. Ltd., Caxton House, London, at 8 shillings.

This book is devoted largely to the use of arc welding in general production manufacturing. No longer can arc welding be looked upon as a repairing or salvaging process. The arc welder is a production tool and this book makes it evident that a knowledge of arc welding principles should be a part of the equipment of every designer and manufacturer working in iron and steel. The book contains more than 200 illustrations, chiefly of products of representative manufacturers which have been manufactured by arc welding. In addition, there are numerous diagrams and charts showing welding speeds and costs.

It is demonstrated in this book that a welded joint can be 100 per cent efficient. Tank builders were among the first to recognize the economy of arc welding and today there are few tank shops that do not use arc welding.

Opportunities for substitution of arc welded steel for castings are outlined. It is claimed that 90 per cent of the iron castings now used could be replaced by arc welded steel at a decided saving. There is a complete discussion of how to go about redesigning castings for manufacture in welded steel and the illustrations show clearly where this is being done commercially by representative manufacturers. Examples of complicated cast machinery bases and other cast iron parts are shown reproduced in welded steel and in many instances cost figures are given.

Superiority of steel over cast iron from both the standpoints of strength and economy is contained in the opening chapter of the treatise. The addenda to Chap. I is a technical discussion of this subject with diagrams and references to recognized authorities.

A most impressive point about the book is the wealth of illustrations showing products which now are being manufactured by means of the new process. The procedure for redesigning machine parts is treated at length and there is complete data on the strength and cost of various types of welded construction. One chapter is devoted to automatic arc welding and there are numerous photographs of products automatically welded.

* * *

More About Furnaces

Industrial Furnaces, Vol. II; by W. Trinks; cloth, 405 pages, 6 x 9 inches; published by John Wiley & Sons Inc., London and supplied by IRON TRADE REVIEW at $5.00 net and in Europe by Penton Publishing Co. Ltd., Caxton House, London, at 1 pound 5 shillings net.

While this volume is a continuation of the first, it is complete in itself. The first volume contains much theory and appeals largely to the designer of furnaces, the second is devoted principally to practice and appeals more largely to co-ordinators of existing designs.

Much equipment is described in this volume, fundamental types being selected by preference. Some of this is patented and use of devices described in the book, the author warns, may be infringement unless its status is investigated.

Because of the wide field covered the author has been compelled to avail himself of the experience of others and the volume is to some degree a composite of the thought of this branch of industry.

Fuels and sources of heat energy treated in the first chapter, and combustion devices and heating elements follow. Control of furnace temperature and atmosphere and labor saving appliances then are treated and the author essays a critical comparison of fuels and furnace types to aid in choice of the proper form of furnace. In the final chapter selection of fuel and furnace to suit plant conditions is outlined.

Describes Gun Making

An address entitled "Gun Tubes" was presented by Dr. F. C. Langenberg before the New York chapter of the American Society for Steel Treating at New York, Dec. 13. Dr. Langenberg is associated with the Watertown arsenal and is regarded as a leading authority on castings and forgings for heavy ordnance and coast defense artillery. His remarks included centrifugal casting, X-ray inspection, strengthening by cold work and overstrain. The speaker received the 1926 Howe medal from the American Society for Steel Treating for a paper covering much this same subject.

Editorials

Education a Prime Prosperity Factor

AUTOMOBILES, radio sets, electrical household appliances and bank accounts—these are the things generally referred to as evidence of American peaks of prosperity, the physical comforts and luxuries of more than 43,000,000 wage earners and their families. Reading some of the indices of our national status one might liken the impression he receives to the cloying taste of too much sugar, that our life is summed up in material sensations of well-being, that we are wallowing in them to the exclusion of other perfections. The invidious European's misunderstanding of our ideals could be forgiven.

Such symbols are definite and easy to grasp and are the best means available for the purpose, but they do not present the full purport or vital truth of the matter. The best symbol of all, if the facts could be grouped and visualized and numbered as we do automobiles and radio sets, would be the index of better and more general education. Financial prosperity is doing more to promote the welfare of the American people through the medium of education than are the objects enumerated, though they contribute powerfully to the same goal.

The coolie without education has few needs; as education increases so do the number of necessities, and the more anxious are people to obtain them. Prosperity is promoting education, through schools and colleges and in many other ways, and education is increasing demands and markets. It is making possible better means for fulfilling them. It is doing so more quickly and thoroughly than is leisure "in which to make purchases."

Leisure falls short of the object by one half, while education goes all the way, providing means as well as desires. Prosperity is insuring itself for the future and is multiplying its benefits at an enormous rate by stimulating the education and the living standards of workers and their children. Which was the better idea—giving the people libraries or extra leisure?

Nothing to Worry About

PLANS have been announced for a 110-story office building in New York and the annual debate concerning skyscrapers is on. It is charged that they cause unspeakable congestion of humans and traffic, blot out sunlight, shut off air, are dull architectually and give the city acute structural indigestion. Their defenders stress the economies of concentration of business, point to low-level London as also having its problems of congestion, praise them as the distinguishing mark of American architecture and denote them an expression of American life in steel and stone.

In modified degree New York's problem is also that of all large American cities. The skyscraper has evident disadvantages but it is here to stay. The trend will be toward restriction as to ground area, relationship of height to street width and other correctives, and not abolition. The skyscraper means much to the steel industry. Last year 15 per cent of the country's output of steel was absorbed by the building industry, exclusive of railroad bridges and structures. The times are enlivened by the pleasantries but the makers of shapes are losing little sleep.

Construction Retains Its Virility

WHILE the crest of building operations this year apparently was passed in the early autumn, the 1926 volume will about equal the impressive 1925 total of six billion dollars.

Since October building activity has become more fitful, particularly as regards contemplated projects. In some sections the ebb has become more pronounced. Credit conditions continue satisfactory for financing sound projects and the labor situation in most localities is favorable, despite high wage rates, but the profits on speculative building have become more uncertain recently as the yawning post-war demand for certain types of structures has begun to be filled. The gap seems to be closing on office and hotel structures, which, however, represent only about one-fifth of the total construction of the country. Demand from this source could drop 25 per cent and the effect on the aggregate would not be vital.

A long-range view at this time, while indicating no trend toward building expansion, reveals no serious recession.

Merger Plan Merits More Analysis

PROBLEMS of railroad consolidation are slated for sharp debate this winter in the midst of the inevitable crowding of issues in the short session of congress. The administration already has declared for passage of a law author-

izing the railroads to merge into fewer systems, on the theory consolidations will bring economies paving the way for lower freight rates.

The house will be the first to take up the consolidation program, although bills are pending in both chambers. The house measure, known as the Parker bill, provides for voluntary consolidation of the roads by purchase, lease, merger or holding company, the first move in each case to be made by the carriers desiring consolidation. The interstate commerce commission would pass only upon the completed plans.

The most acceptable view of this question is that it would be unsafe for congress to pass the Parker bill in the manner that would be necessary to get it through this session. Few in congress have any fundamental grasp of this measure. Cursory hearings were held last spring before the interstate commerce committee of the house, but the freight-paying public was not represented. Committees of shippers to be affected also should be heard.

These are general objections. More specific criticisms can be cited. The time is far too short for an orgy of consolidation debate. The importance of the problem calls for more mature judgment than congress is prepared to give this winter.

French iron and steel producers are reducing a slag with an iron content over 60 per cent unearthed from the site of old Roman charcoal iron works, says the *New York Times*. For practically nothing they can obtain a similar slag from American charcoal stacks, efforts at reclamation having failed.

Prime Need Is Efficient Tools

NEW England industrialists have pointed out repeatedly that the district's greatest handicap is not high freight rates but antiquated manufacturing equipment. Howard Coonley, head of the Walworth Mfg. Co., recently stated at Boston that the way out for New England manufacturers is through the installation and use of efficient machinery.

An analysis by the Boston chamber of commerce shows on foundry work output per man in New England is far below that in other parts of the country. One manufacturer operating plants in New England and the Middle West recently carried out an experiment in the production of heavy cast iron parts. The latest automatic equipment was purchased at the New England plant for the full sequence of operations, with the result that costs dropped to the level of midwest practice.

Mr. Coonley said further that New England to compete successfully with the rest of the country must adopt the latest scientific methods of production and merchandising.

The past year has seen a surprising awakening to the need of modern equipment on the part of New England manufacturers. Makers of machine tools themselves have been unusually heavy buyers of tools. Progressive manufacturers everywhere are taking stock of their own production equipment. It is too early for concrete evidence of this to appear on balance sheets but there is little doubt that the New England industrial situation is less acute today than it was a year ago, and further progress in modernization of equipment may well be looked for in 1927.

What Our Readers Are Thinking

Advantages in Hand-to-Mouth Buying

HAND-TO-MOUTH buying is transferring to a greater degree, the risks of manufacturing and merchandising to the shoulders of those best able to carry them. It is relieving the retailer of a part of the business risk which he has formerly borne and putting it back on the wholesaler and manufacturer, who are more intelligent, better informed, and, therefore, better able to carry the risk . . . at less cost than the retailer has done.

In the second place, small-order buying has enormously reduced the volume of shelf-worn and out-of-date merchandise which, under the older system, sooner or later had to be sold at a sacrifice. This entailed not only immediate losses to the retailer himself, but ultimately losses, though perhaps indirect, to the manufacturer, the distributor, and society at large.

In the third place, this more rapid turnover of goods, for reasons already suggested, means a more effective use of capital in business and hence an economic advantage which ultimately is shared by the public, including not only the consumer but also the producer and distributor. One of the slowest lessons to be learned by merchants is that good merchandising consists in getting the money out of goods. "Move them at some price, but move them," ought to be the first rule of good merchandising.

In the fourth place, the larger economic gains of having raw products turned into finished goods and into the hands of consumers as quickly as possible mean enormous economic and social gains. It reduces the stocks of distress and second-hand merchandise. By keeping inventories of manufacturers, wholesalers and retailers small, an enormous sum of capital is released for other industrial uses and the whole system of production and distribution is keyed up to a higher pitch of efficiency. —Dr. W. F. Gephart, vice president, First National Bank, St. Louis, in *Printer's Ink*.

The Readers' Page

Vol. LXXIX, No. 27 IRON TRADE REVIEW Dec. 30, 1926

A Great Annual for a Great Industrial Year

A GREAT industrial year such as 1926 deserves a thorough efficient and comprehensive review of its activities and their significance, and that fundamentally is what IRON TRADE REVIEW'S annual issue, to be published Jan. 6, offers to its readers. It is more than retrospective, however, because its leading articles are constructive, rather than merely descriptive. The general theme of the Yearbook of Industry, is the responsibility of management to sustain present prosperity. Thirty pages are devoted to seven special articles, 36 to eight regular features, eight to business trend charts, 32 to domestic market reviews and long-range price tables, 14 to foreign markets and long-range prices, ten to miscellaneous subjects and others to price charts and etchings, a total of 130 pages. It is an issue that every wide awake executive will use throughout the year.

Welding Pipe Lines in Oil Fields. Page 1673.

Contents

SPECIAL ARTICLES

Welding of Pipelines Gains Oilfield Approval ..... *By Dudley W. Moore* 1673

Bearings Require Clean Steel—II ..... *By John D. Knox* 1675

Cites Steel Casting Defects ..... *By R. S. Munson* 1680

Europe Struggles for Stability ..... *By Vincent Delport* 1683

Large Uses of Steel in Small Ways—Telephone Indices 1685

Editorials 1687

BUSINESS TREND

Steel Prices Stable and Low ..... *By John W. Hill* 1690

Steel Price Index 1690
Freight Traffic 1691
Machine Tools 1691
Building Costs 1692
Steel Price Parity 1692
Steel Castings 1693
Sheet Situation 1693

MARKET REPORTS

Review of Markets 1694
Iron and Steel Prices 1695, 1696, 1700, 1709, 1732

Pig Iron 1697
Coke 1698
Ferroalloys 1698
Semifinished 1699
Plates 1699
Iron and Steel Scrap.1701
Sheets 1701
Tin Plate 1702
Pipe 1702
Bars 1703
Structural Shapes 1704
Reinforcing Bars 1705
Railroad Equipment..1706
Cold Finished Steel ..1707
Nuts, Bolts, Rivets ..1707
Wire and Nails 1707
Nonferrous Metals 1708
Coke By-Products 1708
Warehouse 1709
Pacific Coast Markets 1710
Foreign Markets 1719
Machinery Markets ..1723
Crane Inquiry and Awards 1723

GENERAL NEWS

Exports Heaviest Since 1924 1713
Germans Study Steel Practice 1715
Industrial Men in the Day's News ..... *J. Fletcher Harper* 1717

Men of Industry 1718
Statistics of Industry.1721
Obituary 1722
Here and There in Industry 1724
Business Changes 1725
Construction and Enterprise 1726
Trade Publications ..1729

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Francis F. Light.....Circulation Manager

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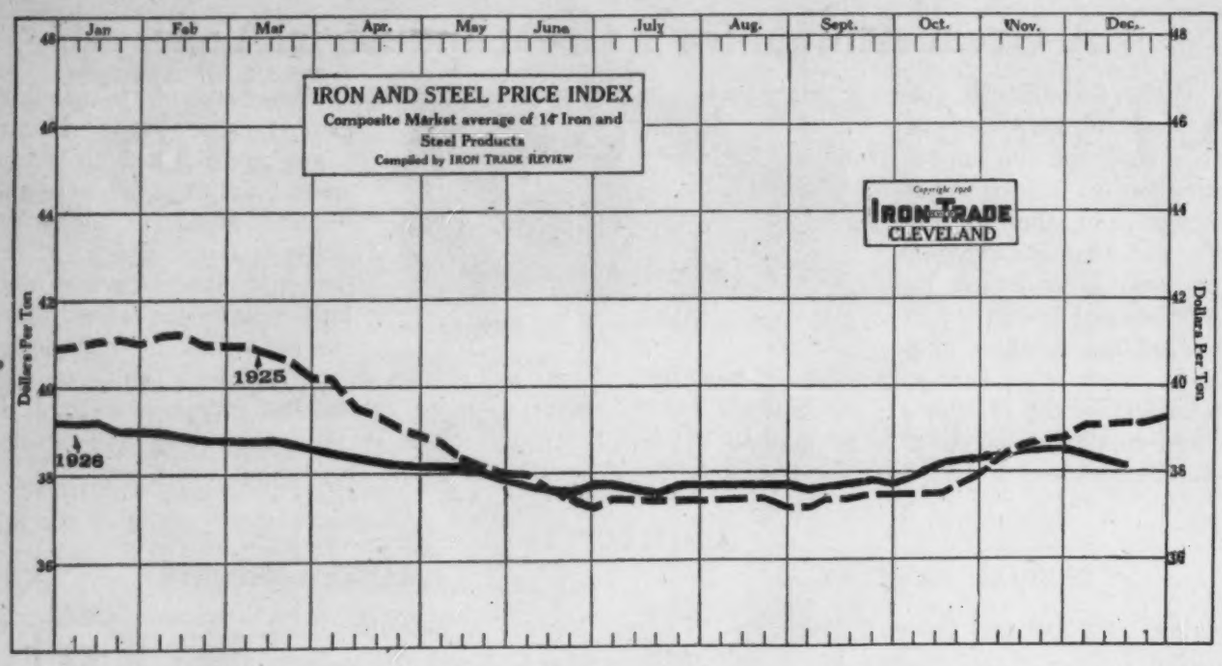
The Business Trend



Steel Prices Stable and Low

By JOHN W. HILL, Financial Editor

ONE of the most noteworthy facts about the iron and steel trade in 1926 has been the narrowness of the price movement. The curve of prices gives not the slightest hint of the real events of the industry. From it alone no one would ever guess that demand, output and profits climbed to extraordinary peaks.

ON THE contrary the movement of prices paints a picture of a listless dragging year, a little more pronounced at the close than at the beginning. For iron and steel prices, represented by IRON TRADE REVIEW composite market index, stands lower now than it did last year at this time.

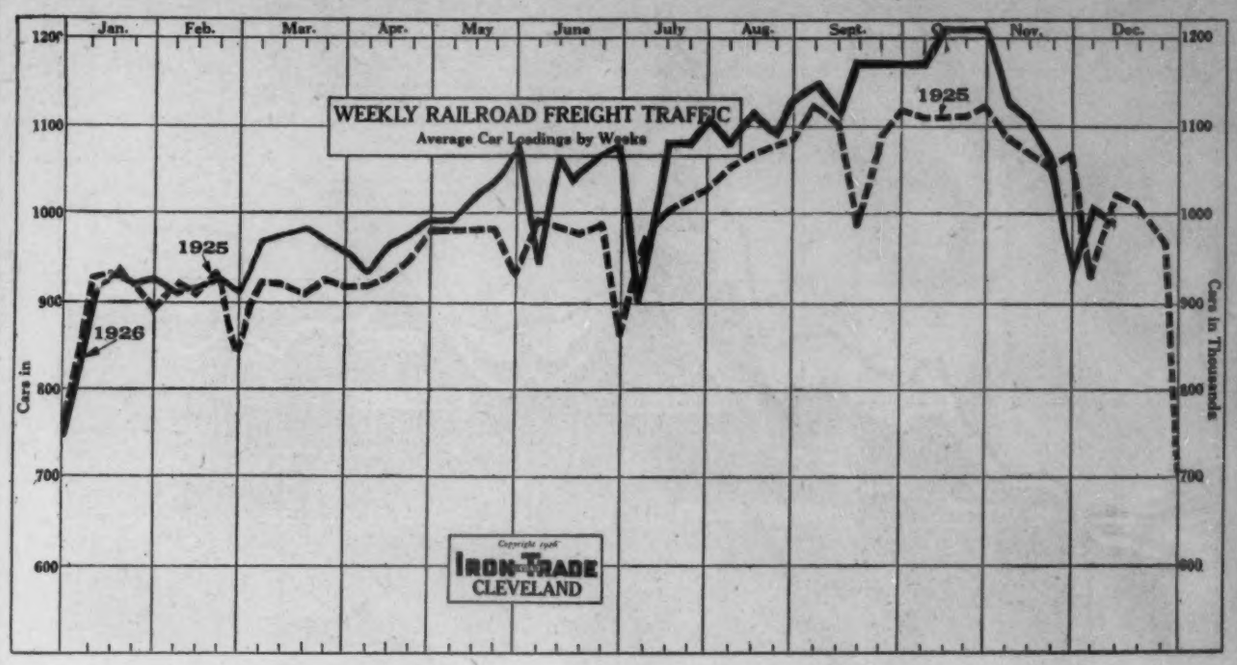
IN DECEMBER, 1925, the composite was $39.14 a ton. At the present it is about one dollar lower, or a trifle above $38 a ton. Iron and steel prices, as shown by the diagram, declined gradually until in June. The index dropped below $38 a ton. It drifted during the summer and until October when there was a show of strength which lasted until early December.

LOOKING at the record of 1926 it may almost be said that the iron and steel trade has reached a certain stability of prices at a low level. Compared with other industrial products steel is far less dear. The composite market average stands about 44 per cent over the 1913 level. The average of other industrial prices is about 60 per cent over 1913.

THAT the industry was able to show relatively good earning returns upon the year's business was due to volume. Efficient productive methods and large volumes were sufficient to offset the effect of low prices. Manifestly it is more important for the industry to have a large proportion of its facilities employed than to have high prices.

A HIGHER average rate of operations would come from a better balance of supply and demand. That, apparently, is one of the indications of 1926. Outputs were kept at a surpassing gait without the artificial stimulus of overbuying. Under normal conditions the country's requirements are not far behind productive facilities. That should make for continued price stability.

The Business Trend

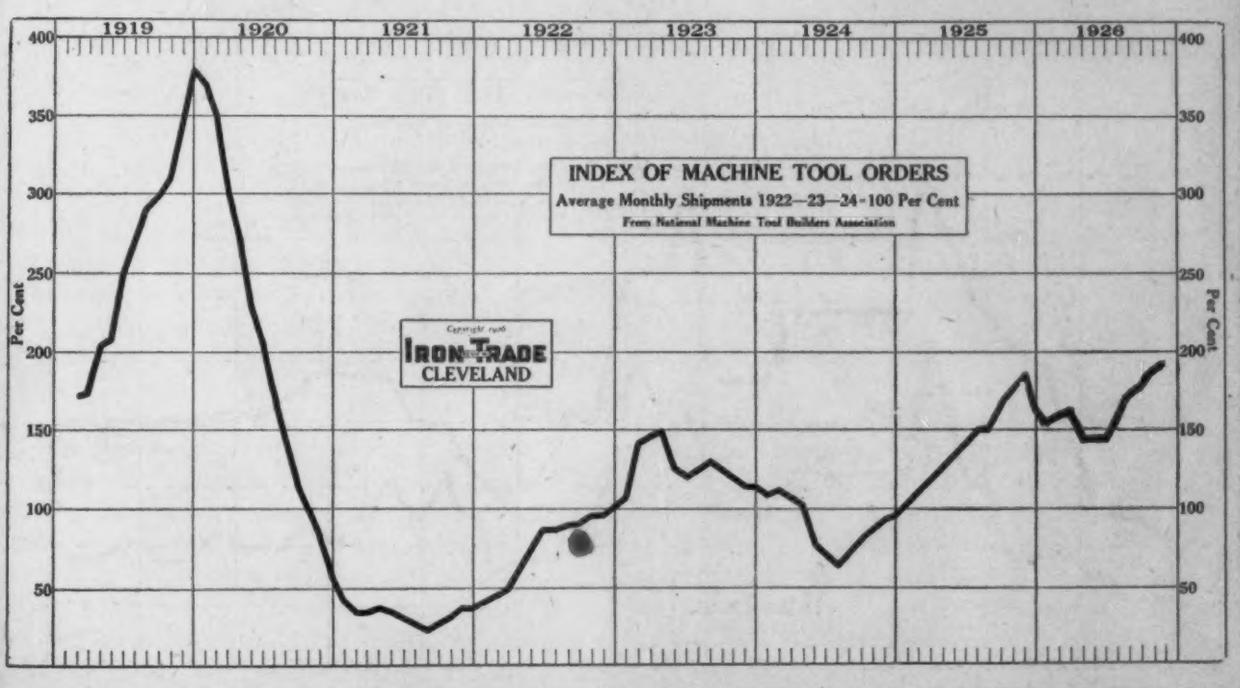


Freight Traffic

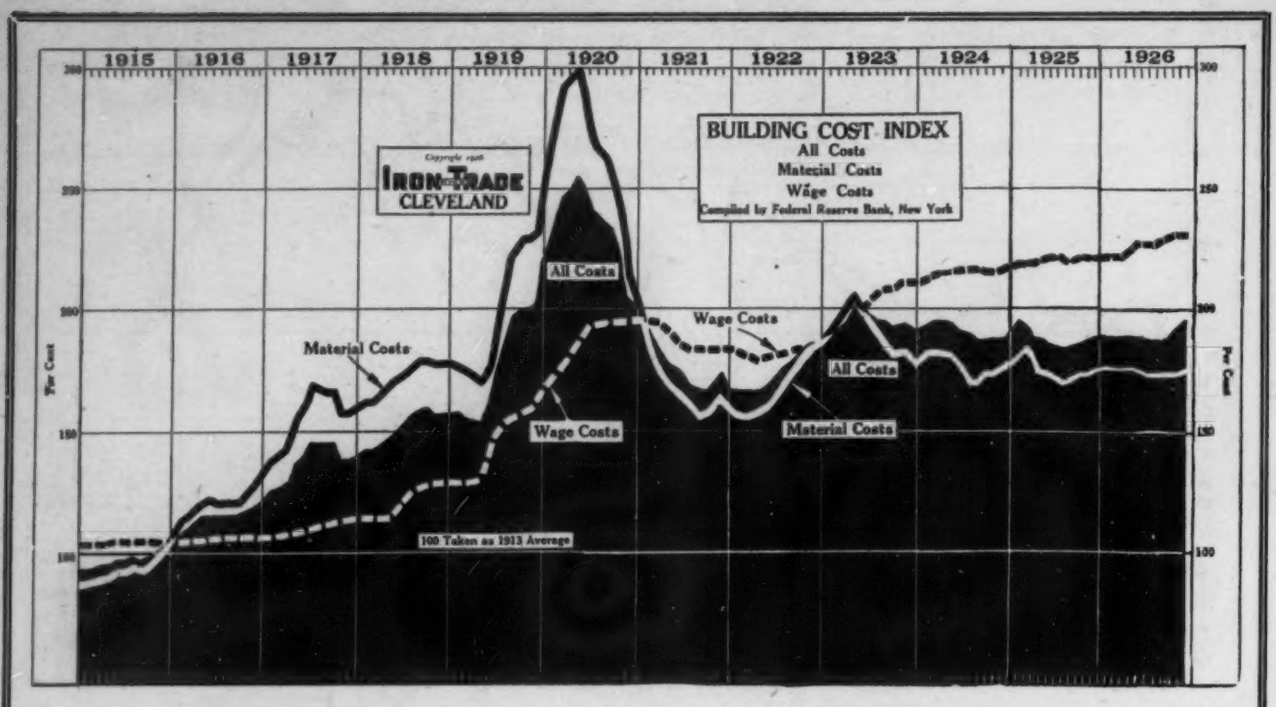
THE movement of freight traffic in the week ended Dec. 11, was rather sharply downward. The decline occasioned considerable interest because the total car loadings for the week was below the corresponding week of 1925 for the first time since January. The loadings amounted to 998,715 cars. The drop was 59,000 from the preceding week and one of 10,000 from the same week one year ago. The decline is seasonal and reflects the quietness for industry which is normal at this time of the year.

Machine Tools

THE three months' average of gross orders of machine tools as computed by the National Machine Tool Builders association continues to rise. The volume of machine tool orders reported for November was considerably below that of the preceding month but not low enough to turn the total three months' average index line downward. The total index stands at 188.1 per cent which is 31 per cent above the year's low point of May when the index stood at a level of 143.1 per cent.



The Business Trend

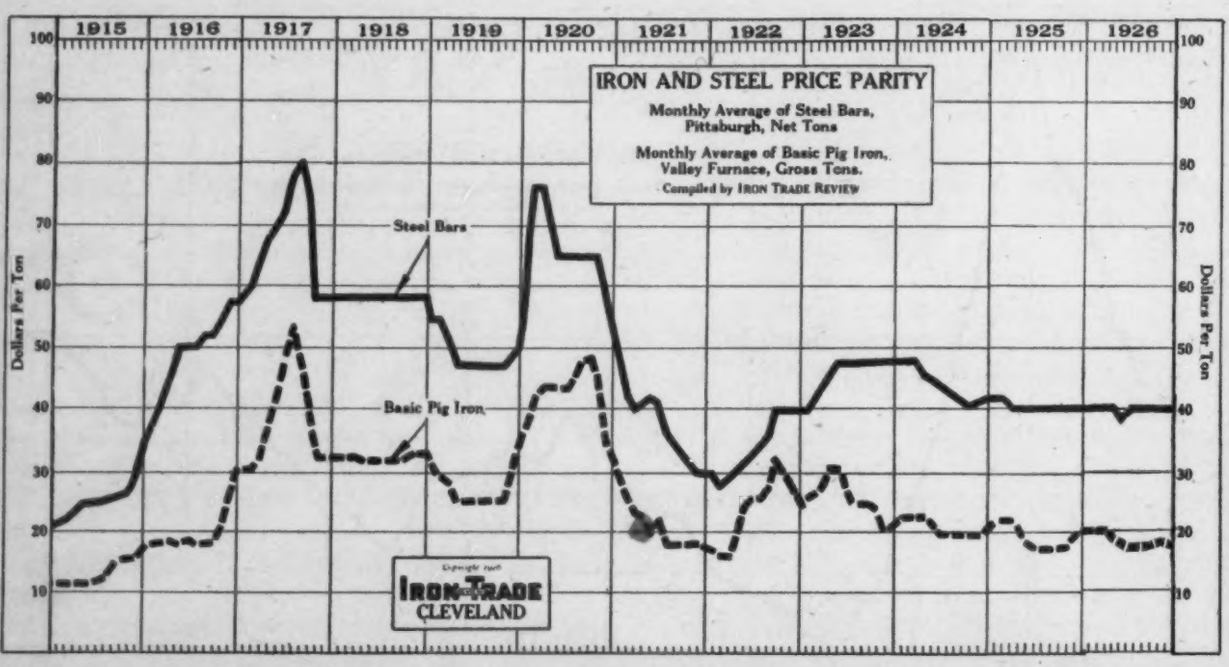


Building Costs

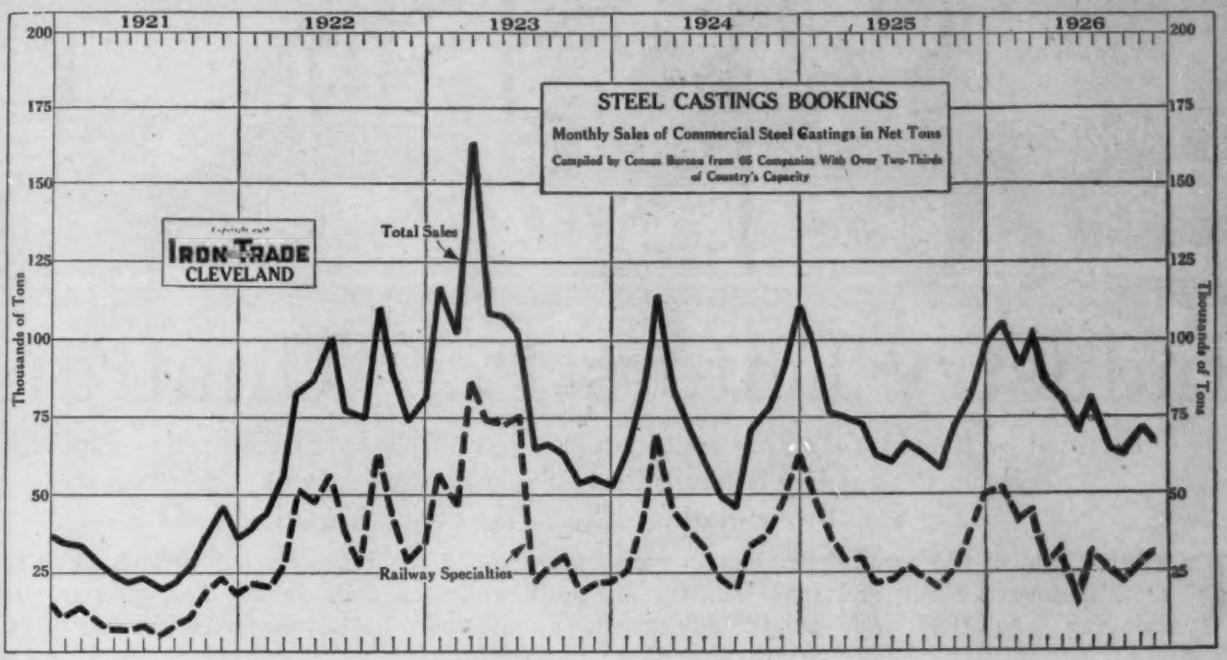
THE year is closing with a rising tendency for building costs. During November the index of the cost of building as reported by the federal reserve bank of New York was 96 per cent over the 1913 level. This compared with 94 per cent over 1913 one month before. The rise was occasioned by an increase in the cost of material which advanced to 74 per cent over 1913. This compared with 72 per cent over 1913 in October. Wages continue unchanged at their high peak of 128 per cent above 1913.

Steel Price Parity

THROUGHOUT all the recent vicissitudes of the steel trade, the quotation for steel bars has remained unchanged at $40 a ton. Basic valley pig iron, however, has fluctuated and in December it had fallen to $18.50 a ton. In November the price rose to $19 under the influence of soaring coal and coke prices. With the settlement of the British strike and the subsequent subsiding of the domestic fuel markets, pig iron reacted and the year closed with dullness prevailing in the market.



The Business Trend

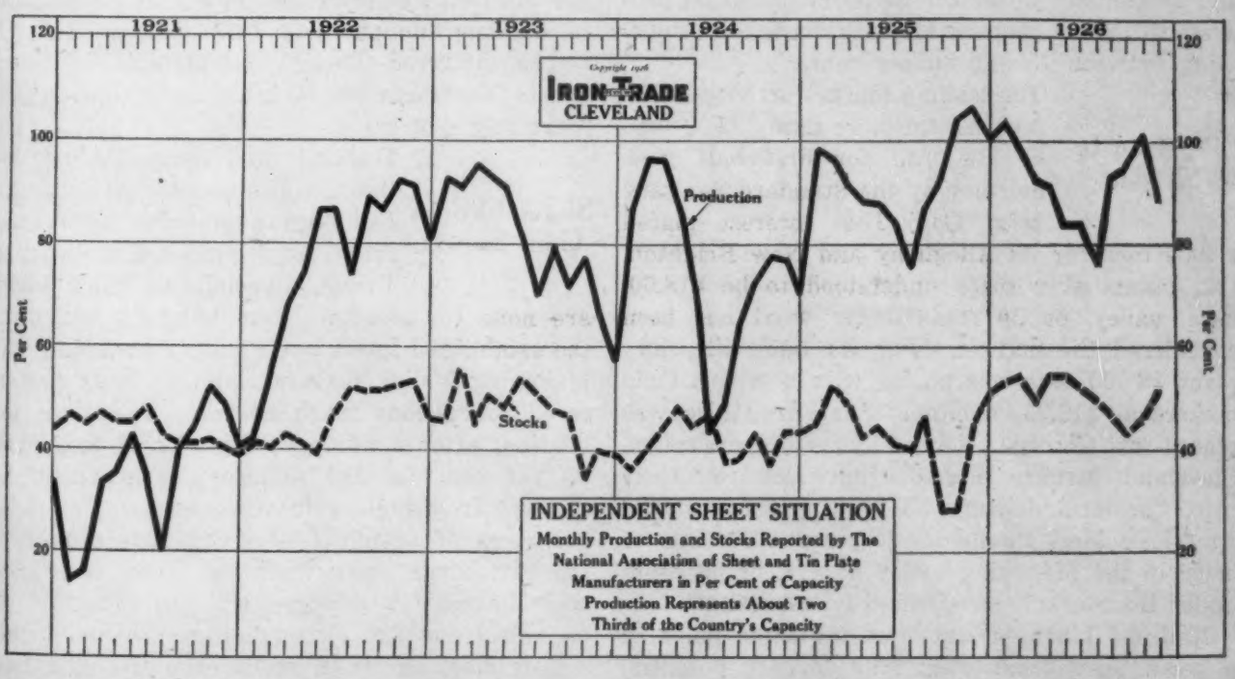


Steel Castings

BOOKINGS of steel castings in November as reported to the department of commerce by leading manufacturers showed a decline. The total was 53 per cent of shop capacity against 56 per cent one month before and 66 per cent 12 months ago. Although there was a loss of total bookings, orders for railway specialties increased slightly from 27,822 tons to 28,079 tons in November. In November, 1925 railway specialty bookings amounted to 38,485 tons. Production of castings in November gained.

Sheet Situation

SOME recession in the buying of sheets in November is reflected in the statistics of the national association of sheet and tin plate manufacturers. Sales declined to 57.8 per cent of mill capacity compared with 68.3 per cent one month before. The total production dropped to 67 per cent of capacity of mills compared with 101 per cent one month before. Unfilled tonnage also declined. Meanwhile stocks increased slightly during the month, standing about 51 per cent of capacity of the mills at the end of November.



Industry Enters 1927 Unafraid

Fortified by Record Year, Iron and Steel Producers Welcome First Quarter—Low Point in Present Dip Believed Past—Sanitary Ware Interest Places Pig Iron Below Market—Sheet Prices Show Variation

PASSING out of the greatest production year in its history the iron and steel industry is swinging into 1927 with solid confidence that consumption will shortly attain the high average of the past year and buying on a comparable scale cannot be long deferred. Variations in production and shipments the past few weeks and the relatively light commitment of mill capacity are appraised as year-end phases and have not dimmed the general outlook.

New orders and specifications for iron and steel have been measurably higher than production and shipments in the past few days. In some instances, notably pig iron, this improvement has been partially at the expense of price. Some independent producers have been pressed to maintain 65 to 70 per cent operations but the feeling is general that the low point has been passed and as January opens the betterment will be progressive. Steel corporation subsidiaries are operating between 75 and 80 per cent.

Pig Iron Is Shaded

The leading market activity is the purchase of more than 38,000 tons of pig iron for first half year delivery by the Standard Sanitary Mfg. Co. This interest placed 20,000 tons for its Allegheny and New Brighton, Pa., plants at a price understood to be $18.50, base, valley, or 50 cents under what has been considered the market. For its Louisville, Ky., plant 18,000 tons was placed with southern Ohio makers at $19.75, Ironton. Some iron also was placed at Chicago. By way of repercussion, Cleveland furnace interests have lowered their price for local delivery 50 cents. Offers of the American Steel Foundries to place 4000 tons of basic in the Mahoning valley at $18, or 50 cents under the market, have found no takers.

Railroad business stands at the same point as a week ago, constituting the largest potential tonnage for the industry, but awards have been postponed until early in the first quarter. Chicago mills have booked nearly 20,000 tons of rails, plus accessories, and it is apparent that rail production there must be stepped up to capacity immediately if specifications are to be met. Track fastening inquiry at Chicago totals 20,000 tons.

Coke Wage Debated

Connellsville coke operators are expected to act shortly in the matter of wages, with a return to the 1917 scale the most probable action at this time. Some blast furnaces apparently have discounted a wage reduction in their recent sales. Distress coke has been sold at $3.25 but on lots of 50 to 100 cars $3.35 is the more usual quotation. The top of the foundry coke market is $5.50, except for premium brands. A Buffalo producer of by-product coke has reduced his price 75 cents. A Chicago interest has announced a first quarter price of $10.25, delivered Chicago, the same as for fourth quarter contracts but 50 cents under the recently prevailing spot price.

Sheet Orders Gain Slowly

Demand for sheets, while still light, continues to pick up and has been augmented by releases from some automotive interests. Prices, especially of black sheets, are none too steady. Two dollars a ton under the established levels is frequently done and some Mahoning Valley makers claim to have encountered concessions much deeper. Tin plate production, after a number of weeks at more than 90 per cent for the industry as a whole, has suffered from holiday interruptions.

Buyers of semifinished material, especially in the Pittsburgh district, display more interest in their January requirements. The bases of $35 on billets and $36 on sheet bars are maintained.

Soft steel bar sales at Chicago the past week

exceeded those of the preceding week by fully 50 per cent, due largely to the covering by auto mobile makers.

Structural steel awards, featured by the 12,000 tons placed for the State Bank building in Chicago, reached a total of 33,040 tons this week.

Slack buying has reduced the backlogs of pipe mills and prompt deliveries on practically all sizes are now possible.

IRON TRADE REVIEW composite of fourteen leading iron and steel products continues to decline, due to softening pig iron prices, being $38.08 this week compared with $38.12 last week. A year ago this barometer stood at $39.14.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Dec. 29, 1926	Nov. 1926	Sept. 1926	Dec. 1925
PIG IRON				
Bessemer, valley, del., Pittsburgh	$21.76	22.01	19.96	22.76
Basic, valley	18.50	18.75	17.30	20.00
Basic, eastern del., eastern Pa.	22.25	22.50	20.76	23.00
*No. 2 foundry, del., Pittsburgh	20.26	21.36	19.46	22.26
No. 2 foundry, Chicago	21.00	21.00	21.00	25.00
*Southern No. 2, Birmingham	20.00	20.00	20.80	21.60
*Southern Ohio, No. 2 Ironton	20.00	20.00	20.00	21.10
**No. 2X, Virginia furnace	23.00	22.75	23.00	23.30
**No. 2, eastern, del. Phila.	23.26	23.51	22.26	24.26
Malleable, valley	18.50	19.75	17.70	20.50
Malleable, Chicago	21.00	21.00	21.00	23.00
Lake Superior charcoal, del. Chicago	27.04	27.04	29.04	29.04
Gray forge, val., del., Pittsburgh	19.76	21.01	19.11	21.76
Ferromanganese, del., Pittsburgh	104.79	104.79	92.79	119.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	3.25	4.75	3.25	4.00
Connellsville, foundry, ovens	4.50	5.85	4.50	5.10
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	36.00	36.00	36.60
Sheet bars, open-hearth, Pittsburgh	36.00	36.00	36.00	36.60
Billets, open-hearth, Pittsburgh	35.00	35.00	35.00	35.20
Wire rods, Pittsburgh	45.00	45.00	45.00	45.40
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	2.00	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, Philadelphia	2.32	2.32	2.27	2.32
Iron bars, Philadelphia	2.27	2.22	2.22	2.22
Iron bars, Chicago	2.00	2.00	2.00	2.00
Beams, Pittsburgh	2.00	2.00	2.00	1.95
Beams, Philadelphia	2.22	2.22	2.22	2.17
Beams, Chicago	2.10	2.10	2.10	2.10
Tank plates, Pittsburgh	1.90	1.90	1.90	1.90
Tank plates, Philadelphia	2.22	2.22	2.22	2.07
Tank plates, Chicago	2.10	2.10	2.10	2.10
Sheets, black, No. 24, Pittsburgh	3.00	3.10	3.05	3.35†
Sheets, blue anl., No. 10, Pittsburgh	2.30	2.40	2.30	2.50
Sheets, galvanized, No. 24, Pittsburgh	3.85	3.95	3.95	4.60†
Sheets, black, No. 24, Chicago	3.20	3.25	3.15	3.50†
Sheets, blue anl., No. 10, Chicago	2.50	2.55	2.45	2.65
Sheets, galvanized, No. 24, Chicago	4.05	4.10	4.00	4.75†
Wire nails, Pittsburgh	2.65	2.65	2.65	2.65
Wire nails, Chicago	2.70	2.70	2.70	2.70
Tin plate per base box, Pittsburgh	$5.50	5.50	5.50	5.50
†Based on No. 28 gage.				
OLD MATERIAL				
Heavy melting steel, Pittsburgh	17.00	17.00	17.75	19.00
Heavy melting steel, eastern Pa.	15.75	15.95	16.85	17.65
Heavy melting steel, Chicago	13.00	13.00	14.10	15.50
No. 1 wrought, eastern Pa.	16.00	17.00	17.00	18.75
No. 1 wrought, Chicago	13.75	14.10	14.55	15.40
Rails for rolling, Chicago	16.00	16.50	17.25	18.55

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Dec. 29, 1926)	$38.08
Last week (Dec. 22, 1926)	38.12
One month ago (November, 1926)	38.43
Three months ago (September, 1926)	37.76
One year ago (December, 1925)	39.14
Ten years ago (December, 1916)	53.68
Thirteen years ago (December, 1913)	23.29

Late News Flashes

Rail Production to Be Accelerated

Chicago, Dec. 28.—Steel mill operations here continue slightly below 80 per cent. Due to pressure from the railroads for delivery of track equipment early in 1927, rail mill operations of the leading interest must be increased more rapidly than expected.

Cast Pipe-Replogle Merger Rumored

New York, Dec. 28.—The United States Cast Iron Pipe & Foundry Co. and the Replogle Steel Co. may be merged, according to an unconfirmed report. The Warren Foundry & Pipe Co., which is making sand-spun cast iron pipe, is a subsidiary of the Replogle company.

Doubt Report of Coal Parley

Cleveland, Dec. 28.—Reports from Indianapolis that representatives of bituminous coal operators in the central competitive field and of the United Mine Workers will meet at Miami, Fla., Feb. 14, to consider a wage scale to succeed the Jackson agreement expiring March 31, are not credited in the coal trade here.

Expect Decision Soon in Dumping Case

Washington, Dec. 28.—Definite action by the treasury department in connection with alleged dumping of German pig iron and a countervailing duty is looked for shortly. Those in touch with the situation believe dumping charges will be substantiated, but no countervailing duty will be ordered. Finished steel products still are under investigation.

Penn Seaboard Brings in Wire Mill

Philadelphia, Dec. 28.—Penn Seaboard Steel Corp. has placed in operation its combination wire mill consisting of 21-inch roughing mill and 10-inch finishing mill. John F. McConnell, formerly with United Alloy Steel Corp., Canton, O., and Interstate Iron & Steel Co., Chicago, has been elected vice president in charge of operations of the Penn Seaboard corporation.

Finishing Rates in Valley Are Lower

Youngstown, O., Dec. 28.—Steel production of the independents in this district is close to 60 per cent and that of the Carnegie Steel Co. 75 per cent for the final week of 1926.

Finishing mill operations are at the lowest rate of the year at 50 per cent of sheet capacity, less than 30 per cent of steel bar, 65 per cent of tube mill, 65 per cent of skelp mill, 70 per cent of strip and about 85 per cent of tin plate capacity engaged.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Philadelphia	40.30
Chicago	35.00
Forging, Pittsburgh	40.00
Forging, Philadelphia	45.30

SHEET BARS

Pittsburgh	$36.00
Youngstown	36.00

SLABS

Pittsburgh	$35.00
Youngstown	35.00

WIRE RODS

Pittsburgh	45.00
Cleveland	45.00
Chicago	46.00

Standard extras, $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp	1.90c
Universal skelp, Pittsburgh	1.90c
Sheared skelp, Pittsburgh	1.90c

Structural Shapes

Pittsburgh	2.00c
Philadelphia	2.17c to 2.32c
New York	2.19c to 2.34c
Chicago	2.10c
Cleveland	2.19c
Birmingham	2.15c to 2.25c

Steel Plates

Pittsburgh	1.90c
Philadelphia	2.22c
New York	2.24c
Chicago	2.10c
Cleveland	2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.00c
Pittsburgh, cold finishing	2.15c
Pittsburgh, forging quality	2.15c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
*Cleveland, soft steel	2.00c to 2.19c
Birmingham, soft steel	2.15c to 2.25c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.00c to 2.10c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.90c to 2.00c
Mill, rail steel	1.80c
Philadelphia, common iron	2.22c to 2.32c
New York, common iron	2.24c to 2.34c
Chicago, common iron	2.00c

*The 2.00c price applies to a limited range of forms and sizes.

Hoops, Bands, Strips

Hoops, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh over 6 in.	2.30c
Hot rolled strip steel, Pittsburgh, stamping quality, over 6 in.	2.30c
Hot rolled strip steel, Chicago	2.50c to 2.60c
Bands, Chicago, under 6 inches	2.60c
Bands, Chicago, 6 in. and over	2.50c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh	3.25c to 3.40c
Worcester Mass	3.90c
Chicago	3.80c to 4.05c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled, Pittsburgh, Chicago carloads	2.30c to 2.40c
Less carload	2.50c to 2.65c
Steel shafting turned and polished Pittsburgh, Chicago	2.60c

Screw stock base Cleveland $1 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steel

Pittsburgh or Chicago

S. A. E. Series—	
2300 (3½ per cent nickel	4.35c to 4.50c
3100 (Nickel chromium)	3.40c to 3.50c
6100 (Chrome vanadium)	4.25c to 4.30c
6100 (Chrome vanad, spring)	3.80c
9250 Silico-mang. spring)	3.20c to 3.25c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relaying rails, Pittsburgh	23.00 to 25.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c to 2.90c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.90c to 3.00c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. standard	3.90c to 4.25c
Track bolts, Chicago	3.90c
Tie plates, Chicago, Pittsburgh	2.35c

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.o.b. Cleveland and Pittsburgh base.

Wire nails	2.65c
Galvanized nails smaller than 1-inch	4.90c
Galv'd nails, 1-inch and over	4.65c
Plain wire	2.50c
Annealed wire	2.65c
Galvanized wire No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
Polished staples	3.10c
Galvanized staples	3.35c

Conted nails, 100 lb. kegs, subject to Sept. 1, 1926, extra card over wire nail base.

Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	3.00c to 3.10c
No. 24, Philadelphia, delivered	3.32c to 3.42c
No. 24, Gary, Indiana Harbor	3.20c
No. 24, Chicago, delivered	3.25c

TIN MILL, BLACK

No. 28, Pittsburgh	3.15c to 3.25c
No. 28, Gary base	3.35c

GALVANIZED

No. 24, Pittsburgh, base	3.85c to 3.95c
No. 24, Philadelphia, delivered	4.17c to 4.27c
No. 24, Gary, Indiana Harbor	4.05c
No. 24, Chicago, delivered	4.10c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.30c to 2.40c
No. 10, Philadelphia, delivered	2.62c to 2.72c
No. 10, Gary, Indiana Harbor	2.50c
No. 10, Chicago, delivered	2.55c

AUTOMOBILE SHEETS

No. 20, Pittsburgh, base	4.25c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.50

Gary, Ind., base 10 cents higher.

Long ternes, No. 24, base	4.80

*This price is subject to quantity differentials established by individual regulations.

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del. 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3⅛ to 3½-inch	68½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3⅛ to 3½-inch	46 off

Further discounts of seven 5 per cents allowed for carloads and six 5 per cents for less-carload, on lap welded steel. On seamless hot rolled several more 5 per cents allowed.

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.30c
Cut nails, c. l., f.o.b. mills	2.80c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$50.20 to 51.20
Six-inch to 24-inch, Chicago	46.20 to 47.20
Over 24-inch, Chicago	45.20
Four-inch, Birmingham	40.00 to 41.00
Six-inch and over, Birming'm	36.00 to 37.00
Four-inch, New York	53.50 to 55.60
Six-inch and over, New York	49.50 to 51.60
Standard fittings, Bir. base	$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Prices named are for l. c. l. lots. Carloads take an extra 5 per cent off on carriage, machine and plow bolts and lag screws.

*Hot pressed square tapped or blank	$4.00 off list
*Ditto, hexagon	$4.40 off list
*Cold punched square or hexagon blank	$4.10 off list
*Ditto tapped	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

Add 25 cents per cwt. on cold punched and hot pressed nuts.

CARRIAGE BOLTS

(⅜ x 6-inch, smaller and shorter)

Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅜ x 4-inch, hot pressed nuts)

Rolled thread	60 and 10 off
Cut thread	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 3 and 7 heads	50 and 10 off
All other standard heads	50 and 10 off plus 20 per cent
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off
Stove bolts, 80, 10 and 5 off in bulk. In packages, 80, 10 and 5 plus 2½ off.	
Tire bolts	60 and 5 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000 f.o.b. maker's plant, frt. allowed

	S.A.E. Castellated	U.S.S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.30
¾	28.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1⅛	89.00	89.00
1¼	126.00	131.00
1⅜	183.50	183.50
1½	210.00	210.00

HEXAGON CAP SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

SQUARE HEAD SET SCREWS

Milled	80 and 5 off
Upset	80, 10 and 5 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.40c to 2.60c
Structural rivets, c.l., Chi.	2.60c to 2.75c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland, 70, 10 and 5 to 70 and 10 off.

**Rivets, 7/16-inch and smaller, Chicago 70, 10 and 5 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.40 to 6.50 off
Wrought c.l., Pitts. dist.	6.75 to 6.50 off
Lock washers, f.o.b. factory	85 to 90 off

Pig Iron

Sanitary Ware Company Places Over 38,000 Tons Below Recent Price Levels, for First Half—Other Inquiries Developing

PURCHASE of more than 38,000 tons of pig iron for first half by Standard Sanitary Mfg. Co. at prices below recent market levels, is the most important development of the week. The company placed 20,000 tons for Allegheny and New Brighton, Pa., 18,000 tons for Louisville, Ky., and a tonnage for Chicago. The 20,000 tons brought out offers at $18.50, base, valley, and 5000 tons of No. 2X iron was included on the same basis. The iron for Louisville was placed with southern Ohio makers at $19.75, Ironton. The tonnage for Chicago also was purchased at that point. Following these sales Cleveland furnace interests reduced their price for local delivery by 50 cents, and met competition in nearby districts on a basis of $18.50, valley.

PITTSBURGH, Dec. 28.—Buying for first half by the Standard Sanitary Mfg. Co. furnishes the end-of-the-year feature of the pig iron market. Twenty thousand tons was purchased for its Allegheny and New Brighton plants at $18.50, valley. One merchant interest took 1000 tons of No. 2 and 5000 tons of No. 2X on that basis. Another is understood to have booked 8000 tons of one grade and 6000 tons of another. The Standard company also purchased 18,000 tons for Louisville, Ky., at $19.75, Ironton, or $21.90, delivered. Likewise it purchased a tonnage at that point for Chicago delivery. Smaller sales still command as high as $19, valley, for the base grade. One sale of 500 tons of No. 2 iron was arranged yesterday. One lot of 300 tons of No. 2X brought $19.50. Other sanitary ware and radiator companies now are expected to issue formal inquiries. The American Steel Foundries offered to pay $18, valley, for 4000 tons of basic, but was refused by a valley merchant stack quoting $18.50, minimum. Bessemer is selling in single carloads at $20, valley. No large inquiries are out. The Claire stack was blown in today. The Stewart Iron Co.'s stack scheduled for blowing in Jan. 1 will not go in until later in the month.

Boston, Dec. 28.—Piecemeal buying of pig iron continues. The General Electric Co. took 500 tons for Massachusetts plants. Prices are firm. The Everett, Mass., furnace quotes $21 to $21.50, base. Buffalo iron is offered at $19, furnace, for No. 2X iron (2.25 to 2.75 silicon). Five hundred and seventy tons of German iron arrived at Boston during the week.

Buffalo, Dec. 28.—Pig iron inquiry has increased to a total of about 3000 tons. The General Electric Co. has come into the market for 1000 tons in addition to 500 tons previously asked for. Last week's sales probably were the smallest of the year. Shipping directions for early in January are satisfactory to makers. Operations and prices are unchanged.

New York, Dec. 28.—The leading pig iron purchase in this territory the past week involves 1000 tons for Crane Co., Bridgeport, Conn. It is understood the order went to the Mystic furnace, near Boston. Total sales the past week did not exceed 2000 to 3000 tons. Included in new inquiries here are 1000 to 1500 tons for General Electric Co. and 360 tons for New York Central railroad. Chrome Steel Works, Chrome, N. J., wants 1000 to 2000 tons of low phosphorous iron. Prices are unchanged. It is learned that a southern New England consumer which recently bought its basic requirements for first quarter took some Indian iron.

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$20.00
Bessemer, del. Pittsburgh	21.76
Basic, valley	18.50
Basic, del. Pittsburgh	20.26
Basic, Buffalo	19.00 to 19.50
Basic, del., eastern Pa.	22.00 to 23.50
Malleable, valley	18.50 to 19.00
Malleable, del. Pittsburgh	20.26 to 20.76
Malleable, del. Cleveland	20.00
Malleable, Chicago	21.00
Malleable, Buffalo	19.00 to 20.00
Malleable, del., eastern Pa.	23.25 to 23.75
No. 1X Eastern del., Phila.	24.26 to 24.76
No. IX, Buffalo	20.50 to 21.00
No. 1 foundry, Chicago	21.50
No. 2 foundry, valley	18.50 to 19.00
No. 2 foundry, del. Pittsburgh	20.26 to 20.76
No. 2 foundry, Buffalo	19.00 to 20.00
No. 2 foundry, Everett, Mass.	21.50 to 22.50
No. 2 foundry, Chicago	21.00
No. 2 foundry, Granite City	21.00 to 21.50
No. 2 foundry, Ironton	20.00
No. 2 foundry, del., Cleveland	20.00
No. 2 foundry, del., Phila.	22.76 to 23.26
No. 2 foundry, N. J., tidewater	22.28 to 24.76
No. 2X, eastern del., Phila	23.26 to 23.76
No. 2X east N. J., tidewater	22.78 to 25.26
No. 2X, foundry, Buffalo	20.00 to 20.50
No. 2X, eastern del., Boston	25.15 to 25.65
No. 2X, Buffalo, del., Boston	23.41 to 23.91
Continental foundry f.o.b. Boston	21.50 to 22.50
No. 2 Alabama, Birmingham	20.00
No. 2 Alabama, del. Cincinnati	23.69
No. 2 Tenn., Birmingham base	20.50
No. 2 Tenn., del. Cincinnati	24.19
No. 2 Alabama, del. Philadelphia	26.01
No. 2 Alabama, del. Chicago	26.01
No. 2 Alabama, del Chicago (barge and rail)	25.18
No. 2 Alabama, del. Boston (rail and water)	26.81
No. 2 Alabama, del. Cleveland	26.01
No. 2 Alabama, del. St. Louis	24.42
No. 2X Virginia	28.00
No. 2X, Virginia, del. Phila.	28.17
No. 2X, Virginia, del. Jers. City	28.54
No. 2X, Virginia, del., Boston	28.92
Gray forge, eastern Pa.	22.50 to 23.25
Gray forge, val. del. Pitts.	19.76 to 20.26
Low phos., standard, valley	28.00
Low phos., standard, Phila.	25.76 to 28.29
Low phos., Lebanon	25.00
Charcoal, Birmingham	29.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $25.50; 6 per cent $26.50; 7 per cent $27.50; 8 per cent $28.50; 9 per cent $30.00; 10 per cent $32.00; 11 per cent $34.00; 12 per cent $36.00; 13 per cent $38.00; and 14 per cent $40.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent$34.00; 11 per cent $36.00; 12 per cent $38.00; 13 per cent $40.00; 14 per cent $42.00; 15 per cent $45.00; 16 per cent $47.00; 17 per cent $49.50.

*Duty paid, delivered Philadelphia consumers. Prices are f.o.b. furnace except where stated otherwise.

Cleveland, Dec. 28.—The pig iron market is 50 cents lower, without being more active than a week ago. Offers of foundry iron at $18.50, base, valley, from several large producers, which developed on inquiries from the Standard Sanitary Mfg. Co., have reacted on the market here. Cleveland interests now quote $19.50, base, furnace, for local delivery, and are meeting the new valley price in outside competitive territory. The majority of furnace interests represented here have some carry-over on their books, estimated by one producer as sufficient for a month's consumption by smelters. This is expected to have a retarding influence on a broader buying movement for first quarter. Less than 10,000 tons was booked last week by furnace interests represented here. The Ohio Steel Foundry Co., Lima, O., is in the market for 500 tons of basic, and the New York Central railroad wants 360 tons of various grades for Elkhart, Ind., these being the largest inquiries pending.

Cincinnati, Dec. 28.—Purchase of 18,000 tons of northern foundry by the Standard Sanitary Mfg. Co., for first half for its Louisville, Ky., plant has given impetus to the pig iron market in southern Ohio. M. A. Hanna Co., sales agents for the Marting Iron & Steel Co., booked one-third of the tonnage, while the Belfont Steel & Wire Co., also booked a large portion. It is understood the total tonnage was placed under $20, Ironton. The Louisville & Nashville railroad is reported to have bought 500 tons of iron including charcoal and southern grades for first quarter. The Anchor Stove & Range Co., New Albany, Ind., has not closed on is inquiry for 500 tons of northern foundry. while the Lunkenheimer Co., Cincinnati, is in the market for a like tonnage of the same grade.

Chicago, Dec. 28.—While shipments slumped in the holiday period and few orders have been closed, the northern pig iron market remains steady. Release orders for shipment after Jan 1 have become more numerous and it is indicated that some melters needing iron for opera-

(*Concluded on Page* 1711)

Coke

Wage Question May Be Settled This Week—Blast Furnaces Withholding From Market

CONNELLSVILLE operators may take definite action this week on the question of reducing wages to the 1917 scale, some favoring such a course and others opposing it at this time. Pending a decision the coke market appears unsettled, and inquiries from blast furnaces are lacking. Distress lots again are offered at $3.25. By-product coke makers are adjusting prices.

Pittsburgh, Dec. 28.—The question of reducing wages still is uppermost in the beehive coke industry. Some operators look on the market as unable to support the present high basis and believe a reduction to the 1917 scale could be accomplished easily. Others, looking ahead to labor difficulties April 1, believe such action might hasten those difficulties, and they want to avoid them. The coke market is unclarified, with blast furnace operators uncertain about costs. A definite decision may be reached at a meeting this week. Some pig iron sellers already have discounted a wage reduction in selling iron at lower prices. New inquiries from blast furnaces are lacking. The Sharon Steel Hoop Co. is understood to have closed for its requirements. The Reliance Coke & Furnace Co. bought a sufficient quantity in the spot market to enable it to start and to operate a furnace until deliveries begin on January-February contracts. Several other users contemplate purchases as soon as market levels are better defined. Spot prices of $3.25 again are appearing on distress lots, but the minimum on 50 to 100 carloads at a time appears to be $3.35. Foundry coke is selling at $4.50 to $6.25, although $5.50 is the usual maximum outside of certain premium brands.

Production of coke in the Connellsville region for the week ended Dec. 18 was 130,600 tons, compared with 125,990 tons in the preceding week, according to the *Connellsville Courier*.

New York, Dec. 28.—Spot coke sales continue steady and of fair proportions. Prices on spot beehive foundry coke range from $4.50 to $5.50, Connellsville. The usual range on spot beehive furnace is $3.25 to $3.75, Connellsville, although some ovens which have not reduced wages continue to ask $4.50. The only change in by-product foundry coke prices is a reduction of 75 cents a ton by a Buffalo producer, making the new price $9, Buffalo ovens. In northern New Jersey, the market on by-product foundry coke continues $10.59 to $11.77, delivered at Newark and other consuming points, depending on freight rates.

Boston, Dec. 28.—Cold weather has increased the demand for by-product coke. Foundries are commencing to build up reserve stocks and shipments against contracts are heavy. The price is unchanged at $13.50, delivered.

Cincinnati, Dec. 28.—Holidays and inventory periods have curtailed demand for beehive and by-product foundry fuel. While producers of the latter grade have not established their price schedules for January, it is said the price will be 50 cents a ton under the present market. Beehive prices also are expected to take a dip.

Chicago, Dec. 28.—Prices for first quarter on by-product foundry coke are announced at $9.75, ovens, or $10.25, delivered, Chicago, the same as for fourth quarter. While this price may carry over into the second quarter sellers are not seeking first half business. The price remains 50 cents higher than on contract December shipments. Specifications are fair.

St. Louis, Dec. 28.—Producers and distributors of metallurgical coke report shipments holding up well, but new orders arriving slowly. Practically all users are anxious to get in stocks, as they anticipate increased business after the first of the year. By-product plants are operating full. Prices are steady.

Birmingham, Ala., Dec. 28.—Before end of the week coke production will be increased, as requests are being made that shipments be speeded up. Pipe shops will have regular shipments started in a few days. Coke contracts in hand call for considerable tonnage.

Coke Prices

Beehive, Ovens	
Prices per net ton	
Connellsville furnace	$3.25 to 4.50
Connellsville foundry	4.50 to 5.50
New River foundry	7.00 to 9.00
New River furnace	6.00
Wise county furnace	5.50
Wise county foundry	6.00
Alabama foundry	5.00 to 6.00
By-Product	
Foundry, Newark, N. J.; del.	10.59 to 11.77
Foundry, Chicago, ovens	10.25
Foundry, New England, del.	13.50
Foundry, St. Louis	10.50
Foundry, Granite City, Ill.	10.50
Foundry, Birmingham	5.50 to 6.00
Foundry Indianapolis, del.	10.25
Foundry, Ashland, Ky.	8.00
Foundry, Portsmouth, O.	8.00

Ferroalloys

Ferromanganese Users Close for First Half—Prices Steady

Pittsburgh, Dec. 28.—Brisk business characterized the ferroalloys market last week. This week finds additional ferromanganese users protected for first quarter. The majority of users now are said to be under cover although a few larger customers are to be heard from. The price remains firm at $100. English sellers have booked a few small lots. In cases where stocks are unusually large, collected during this quarter at $88, consumers feel they are under no immediate pressure to buy. Some of them probably will not act until February. Several sales of spiegeleisen have been entered, 16 to 19 per cent selling at $36 and the higher grade at $37. A few single carload inquiries for low-grade ferrosilicon are coming out and many users contemplate that method of purchasing for the next few months. Some of the users of the 50 per cent grade are to be heard from. The price is unchanged at $85 delivered.

New York, Dec. 28.—As a result of recent heavy sales, one large domestic producer of ferromanganese has withdrawn from the market. It has booked all the business it cares to handle during first half. Other interests continue to compete for business and considerable tonnage to be placed. The price continues $100, duty paid tidewater. Further business has been placed in spiegeleisen for forward delivery and consumers generally now are well covered for first half. Much spot spiegeleisen continues to be sold at $37, furnace, for the 19 to 21 per cent grade. On some of the larger tonnages closed recently the price was lower.

Special ferroalloys are steady, except ferrotungsten, which is stronger after some price shading. It is said nothing is obtainable for less than $1.05 a pound contained. A few sales of wolframite have been made at $11 a short ton unit, duty paid, and the market here is steady. In Europe tungsten ore is not quite as high as recently.

The Corev Co., Chicago, dealer in strip and sheet steel, has purchased the building at 1834 to 1840 South Fifty-fourth avenue, Chicago, which it has occupied two years under lease.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater	$100.00
Ferromanganese delivered Pittsburgh	104.70
Spiegeleisen 19 to 21 per cent domestic furnace	37.00
Ferrosilicon, 50 per cent freight allowed	85.00 to 87.50
Ferrotungsten standard, per pound contained	1.05
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, cents per pound contained, delivered	11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.15 to 3.65
Ferro-carbon-titanium, car lots, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent material)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23 to 25 per cent, f.o.b. Anniston, Ala., (24 per cent materials)	122.50

†Duty paid.

Plates

New Bookings Are Light—More Tonnage Expected to Develop After Jan. 1

REPORTS of the plate markets show generally quiet conditions. Additional users have placed some tonnages with Pittsburgh district mills, at 1.90c. This price also is applying on a considerable carry-over from fourth quarter. The trade looks for more active conditions after Jan. 1. Among recent awards is 6700 tons for 30 steel barges for Carnegie Steel Co.

PLATE PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Orders for plates recently have been small but they promise to increase. Additional customers have signed up for first quarter. While each producer reports a few instances where, because of shortened operating rates, fourth quarter material was not specified, the orders undoubtedly will be carried over. The price remains 1.90c. While awards in the past week involved only 25 or 100 tons at a time, some western, southwestern and southeastern oil tankage promises better tonnage for January. Recent awards include 6700 tons for 30 coal barges for the Carnegie Steel Co., placed with the American Bridge Co.

Boston, Dec. 28.—Plates sales fell abruptly during the past week bringing the December total below that of November. The price is firm at 1.90c, Pittsburgh, or 2.265c, delivered. In point of tonnage the year probably will take third place on the records for the district.

Cleveland, Dec. 28.—New business in plates has been light and almost wholly for first quarter delivery. One maker reports better business last week than at any time since mid-November. The market appears to be holding at 1.90c, Pittsburgh, or 2.09c, Cleveland.

Chicago, Dec. 28.—Buying of plates was light in the past week, totaling 8000 to 8500 tons. Part of this tonnage was for oil tankage, while a portion went for structural work. Inquiry, largely from oil tankage sources, is above 10,000 tons. Plates are quoted at 2.10c, Chicago, but mills meet competition in the Southwest on a lower price basis.

Philadelphia, Dec. 28.—The two days preceding Christmas, from the standpoint of orders, were the best eastern plate mills have had for months. Mills are operating this week instead of having the usual shut-down. Eastern mills are operating at 50 to 60 per cent. Stocks in hands of consumers and warehouses continue at a minimum. The market is firm at 1.90c, Pittsburgh.

Philadelphia, Dec. 28.—Two structural jobs being figured here—the Atlantic City, N. J., auditorium and the Fidelity building at Philadelphia—call for the thickest foundation plates the trade has known. These jobs want foundation plates 8 to 9 inches thick.

CONTRACTS PLACED

6700 tons, 30 coal barges for Carnegie Steel Co., to American Bridge Co.

250 tons, pipe line, East Bay Water Co., Oakland, Calif., to Western Pipe & Steel Co.

CONTRACTS PENDING

3000 tons, pipe line, Yakima, Wash. It is expected that line will go cast iron and wood stave pipe.

1800 tons, nine 45,000-barrel tanks for Shell Oil Co., Pacific Coast; bids received.

400 tons, work for Standard Oil So., San Francisco; bids being asked.

New Mills Now Operating

Completion of the building program at the Sparrows Point, Md., division of the Bethlehem Steel Co. will make the company's investment in that district over $100,000,000. This year the company completed three open-hearth furnaces, a 46-inch blooming mill, a rod and wire mill and four hot sheet mills at the Sparrows Point plant. The new sheet mills added 35,000 tons of black sheets, giving the Bethlehem company an output of 125,000 tons of black and blue annealed sheets annually. The company now has under construction at the Maryland plant a skelp mill, a sheet bar-skelp mill, two buttweld and two lapweld pipe mills and 12 hot tin mills. The pipe mills will be ready for operation next summer and the tin mills by April. The new hot tin mills will increase the company's complement to 48.

Torrington Co., manufacturers of sewing and knitting machine needles and other hardware, Torrington, Conn., recently declared an extra dividend of 5 per cent in addition to the regular quarterly dividend of 3 per cent.

Semifinished

Users More Active in Covering Requirements One Month Ahead—Prices Stable

A CONTINUANCE of month-to-month buying of sheet bars, billets and slabs is indicated by users in covering at this time for January. Makers of strip, sheets and tin plate have been active in the market. Prices are the same as those in effect through the greater part of 1926. Some mills report improvement in specifications providing slightly better operations.

SEMIFINISHED STEEL PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Inquiries for January tonnage are the feature of the semifinished steel market. Strip sheet and tin plate manufacturers are ready to close for another month. No instance is uncovered where the $35 base price has been cut on billets and slabs, nor where $36 has been shaded on sheet bars. The majority of forging billet users either specified everything due them this quarter or have over-specified. They are renewing contracts for next quarter at $40. Cold finishers have not taken out their entire quotas of wire rods; consequently their contracts will run into the next quarter. Chainmakers and one or two other consuming lines are active as regards specifying and contracting for another quarter. The price of wire rods is unchanged at $45. Skelp is dull and inactive at 1.90c.

Youngstown, Dec. 28.—The few sales of billets and sheet bars being made are for prompt delivery and at the regular prices of $36 for sheet bars and $35 for billets, Pittsburgh and Youngstown bases. No contracting of importance is being done here for first quarter.

Cleveland, Dec. 28.—Specifications for sheet bars, billets and slabs show some improvement. The leading merchant producer here has added four open hearths to its active list, making nine in operation, out of 14. Bookings for first quarter are slow. Prices are steady, sheet bars being quotable at $36, Cleveland or Youngstown, and standard billets and slabs, at $35.

Chicago, Dec. 28.—Billets bookings in the past week totaled 5500 tons. The sheet bar market is quiet. Billets are steady at $35, base, Chicago, while sheet bars are quoted at $36.

Philadelphia, Dec. 28.—Wire rod contracts generally have been entered for the first quarter at $45, Pittsburgh. This figure is firm on all deliveries, and many consumers who inaugurated hand-to-mouth buying this year will continue to purchase on that basis.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	13.00 to 13.50
Boston (dealers)	10.50 to 11.00
Buffalo, No. 1	16.50 to 17.00
Buffalo, No. 2	15.00 to 15.50
Chicago	13.00 to 13.50
Cincinnati (dealers)	12.50 to 13.00
Cleveland, No. 1	14.50 to 15.00
Cleveland, No. 2	14.00 to 14.25
Detroit	12.50 to 13.00
Eastern Pennsylvania	15.00 to 15.50
Bethlehem delivery	15.00 to 15.50
New York (dealers) (yard)	9.25 to 9.75
Pittsburgh, No. 1	16.75 to 17.25
St. Louis	13.00 to 13.50
Valleys, No. 1	16.50

COMPRESSED SHEETS

Buffalo	15.00 to 15.50
Chicago	11.50 to 12.00
Cleveland	13.00 to 13.50
Detroit	11.00 to 11.75
Pittsburgh	15.50 to 16.00
Valleys	15.00 to 15.50

BUNDLED SHEETS

Buffalo	11.00 to 11.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	12.00 to 12.50
Eastern Pennsylvania	12.50 to 13.00
Pittsburgh	14.50 to 15.00
St. Louis	9.00 to 9.50

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	6.00 to 6.50
Detroit	8.00 to 8.50
St. Louis	9.00 to 9.50

STEEL RAILS, SHORT

Birmingham	12.50 to 13.50
Buffalo	17.00 to 17.50
Chicago	16.75 to 17.00
Cincinnati (dealers)	17.00 to 17.50
Cleveland (over 6 ft.)	14.75 to 15.00
Detroit	13.00 to 14.00
St. Louis	16.00 to 16.50

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	13.00 to 13.50
Buffalo	14.25 to 14.75
Chicago (net)	14.00 to 14.50
Cincinnati (dealers) (net)	8.50 to 9.00
Cleveland	11.00 to 11.50
Detroit (net tons)	11.50 to 12.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	10.00 to 11.25
Pittsburgh	13.00 to 13.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	18.00 to 18.50
Cincinnati (dealers)	16.50 to 17.00
Eastern Pennsylvania	19.00 to 20.00
Pitts. billet and bloom crops	21.00 to 21.50
Cleveland, billet and bloom crops	18.00 to 18.50

SHOVELING STEEL

Chicago	13.00 to 13.50
Pittsburgh	12.50 to 13.00
St. Louis	13.00 to 13.50

KNUCKLES, COUPLERS, SPRINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	18.00 to 18.50
Pittsburgh	18.50
St. Louis	14.50 to 15.00

FROGS, SWITCHES, GUARDS

Chicago	14.50 to 15.00
Eastern Pennsylvania	15.00 to 16.00
St. Louis	14.25 to 14.75

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	15.00 to 15.50
St. Louis	13.75 to 14.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	12.00 to 12.50
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	15.00 to 15.50
Chicago, No. 1	13.75 to 14.00
Chicago, No. 2	13.00 to 13.50
Cincinnati, No. 1 (dealers)	11.50 to 12.00
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York, No. 1 (dealers)	14.50 to 15.00
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	17.00 to 17.25
St. Louis, No. 1	12.00 to 12.50
St. Louis, No. 2	13.00 to 13.50

WROUGHT PIPE

Boston (dealers)	9.00 to 9.50
Eastern Pennsylvania	14.00 to 14.50
Buffalo	15.00 to 15.50
New York (dealers)	9.25 to 9.75

YARD WROUGHT

Boston	11.00 to 11.50
Eastern Pennsylvania	16.50 to 17.00

BUSHELING

Buffalo	15.00 to 15.50
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	8.00 to 8.50
Cleveland No. 1	11.75 to 12.00
Cleveland, No. 2	11.25 to 11.50
Pittsburgh, No. 1	14.25 to 14.75
St. Louis, No. 1	11.50 to 12.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 8.50
Boston	8.00 to 8.50
Buffalo	10.00 to 10.50
Chicago	7.25 to 7.75
Cincinnati (dealers)	6.00 to 6.50
Cleveland	9.00 to 9.25
Detroit	7.50 to 8.00
Eastern Pennsylvania	14.00 to 15.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.00 to 12.50
St. Louis	7.00 to 7.50

CAST IRON BORINGS

Birmingham (chemical)	15.50 to 16.00
Birmingham (plain)	8.00 to 8.50
Boston Chemical	10.00 to 10.50
Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	9.75 to 10.25
Cincinnati (dealers)	6.00 to 6.50
Cleveland	11.25 to 11.50
Detroit	9.00 to 9.50
Eastern Pennsylvania	13.00 to 13.50
Eastern Pennsylvania (chem.)	15.50 to 16.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00
St. Louis	10.00 to 10.50
Valleys	13.50

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	7.50 to 8.00
Buffalo	12.75 to 13.25
Cincinnati (dealers)	5.50 to 6.00
Cleveland	11.00 to 11.50
Detroit	8.50 to 9.00
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00

PIPES AND FLUES

Chicago (net)	8.25 to 8.75
Cincinnati (dealers)	7.50 to 8.00
St. Louis	10.00 to 10.50

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago (net)	13.25 to 13.75
Cleveland	12.00 to 12.50
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	11.25 to 12.00
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	8.00 to 8.50
Buffalo	13.00 to 13.50
Chicago	9.25 to 9.75
Cleveland (over 10 in.)	11.50 to 12.00
Detroit	10.00 to 10.50
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	8.00 to 8.50
Chicago	17.00 to 17.50
Eastern Pennsylvania	13.50 to 14.00

ARCH BARS AND TRANSOMS

Chicago (net)	19.00 to 19.25
St. Louis	19.50 to 20.00

Iron Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Cleveland	12.00 to 12.50
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	14.50 to 15.00
St. Louis	10.50 to 11.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	18.00 to 18.50
Buffalo	16.50 to 17.00
Chicago	18.75 to 19.25
Cleveland	16.00 to 16.50
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	21.50 to 22.00
St. Louis	19.00 to 19.50

SHAFTING

Boston (shipping point)	16.00 to 17.00
Chicago	18.25 to 18.75
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	17.50 to 18.00
St. Louis	17.00 to 17.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	15.00 to 16.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	16.00 to 16.50
Buffalo, steel	17.00 to 17.50
Chicago, iron	14.75 to 15.25
Chicago, steel	16.50 to 17.00
Cincinnati	11.50 to 12.00
Eastern Pennsylvania	16.50 to 17.00
New York iron (dealers)	12.50 to 13.50
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	18.50
St. Louis, iron	14.00 to 14.50
St. Louis, steel	15.50 to 16.00

NO. 1 CAST SCRAP

Birmingham, cupola	16.00 to 17.00
Boston	18.00 to 18.50
Buffalo	15.00 to 15.50
Chicago, No. 1 machinery	18.50 to 19.00
Chicago, No. 1 railroad or agricultural	17.50 to 18.00
Cincinnati No. 1 machinery cupola (net tons dealers)	17.00 to 17.50
Cleveland, cupola	15.00 to 16.00
Detroit (net tons)	13.75 to 14.25
Eastern Pennsylvania, cupola	17.00 to 18.00
New York, cupola (dealers)	14.50 to 15.00
Pittsburgh, cupola	16.00 to 16.50
San Francisco, delivered	20.00 to 21.00
Seattle	16.50
St. Louis, railroad	16.00 to 16.50
St. Louis, agricultural	16.50 to 17.00
St. Louis, machinery	19.00 to 19.50
Valleys	17.50

HEAVY CAST

Boston	15.50 to 16.00
Buffalo (breakable)	13.25 to 13.75
Cleveland	12.00 to 12.25
Detroit (automobile) (net tons)	14.50 to 15.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.75 to 13.50
Pittsburgh	15.00 to 15.50

MALLEABLE

Boston, railroad	19.00 to 19.50
Buffalo	17.00 to 17.50
Chicago, agricultural	15.25 to 15.75
Chicago, railroad	16.00 to 16.50
Cincinnati, railroad (dealers)	14.00 to 14.50
Cincinnati, agricultural (dealers)	13.00 to 13.50
Cleveland, agricultural	15.50 to 16.00
Cleveland, railroad	17.00 to 17.50
Detroit	14.00 to 14.50
Eastern Pennsylvania, railroad	16.50 to 17.00
Pittsburgh, railroad	17.00 to 17.50
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	14.00 to 15.00
Boston (dealers)	11.50 to 12.00
Buffalo	17.25 to 17.75
Chicago	16.00 to 16.50
Cleveland	14.50 to 15.00
Eastern Pennsylvania	17.00 to 17.50
New York	13.75 to 14.25
Pittsburgh district	18.00 to 19.00
St. Louis	15.25 to 15.75

LOCOMOTIVE TIRES

Chicago, No. 1	17.75 to 18.00
Chicago, cut	17.00 to 17.50
St. Louis, No. 1	16.25 to 16.75

LOW PHOSPHORUS PUNCHINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh	18.00 to 19.00

Scrap

Quiet Conditions Continue as Year Ends—Buying Not Yet Being Started—Prices Firmer

ALTHOUGH the end of the year is at hand and added buying had been expected to come as the new year appeared, no definite signs of activity have appeared. Sentiment is better and the market has elements of strength under the surface, which is holding quotations fairly firm. A scarcity of desirable scrap is apparent and this is reflected in prices.

Chicago, Dec. 28.—Trading in iron and steel scrap by dealers in a number of cases has been above prices recently paid by consumers, due largely to efforts by dealers to cover short orders and reluctance on the part of those holding railroad scrap to make important sales. Recent railroad offerings have been closed above quoted price levels. A sale of heavy melting steel as part of a contract over-shipment, reported at $13.50, to a mill in this district indicates some strength in melting steel which continues at $13 to $13.50. Dealers are quoting $9.75 to $10.25 for cast borings, but this does not reflect consumer activity in this grade.

New York, Dec. 28.—Placing of several thousand tons by the Lukens Steel Co., Coatesville, Pa., is a development in the eastern scrap market. The material called for railroad steel or equivalent and was closed at $16, delivered. Prices are holding steady. Among the few changes are a reduction of 50 cents in steel shafting, on which dealers are now offering $17.00 to $17.50, New York, and a 25 cent reduction on yard steel for eastern consumption, on which they are now quoting $9.00 to $9.50.

Buffalo, Dec. 28.—Large consumers of scrap will start taking shipments on contracts within ten days, dealers report. Offers for heavy melting steel have not been renewed and there is little buying.

Pittsburgh, Dec. 28.—Scrap buying is quiet. The trade is getting ready for the list of approximately 40,000 tons of scrap from the Pennsylvania railroad, and another large list from the New York Central. Bids on the former will close Jan. 5. Buying is confined to a few small lots, but because good scrap remains scarce the market shows no weakening. Heavy melting steel is still quotable at $16.75 to $17.25, the bases of the last sales, and some want $17.50 for high grade No. 1 industrial or railroad steel. They cannot find buyers willing to go that high and some of the latter will not revise upward their bid of $17.

Cleveland, Dec. 28.—Buying of heavy melting steel and blast furnace scrap by a Cleveland melter has given slight activity to the market. This involved about 2000 tons of each grade and the price was close to the prevailing market. A valley interest has released its embargo and is accepting shipments on its contracts. Other embargoes are about to be lifted.

Detroit, Dec. 28.—Little activity is noted in the iron and steel scrap market as a result of the holiday period. Production of scrap is low as a result of most automobile plants being closed for inventory.

Cincinnati, Dec. 28.—Light specifying by consumers of iron and steel scrap keeps the market quiet. Movement has been on a relatively small scale. Dealer buying prices are considerably under the scale which prevailed at the beginning of the month.

Boston, Dec. 28.—Heavy lists of scrap are appearing as railroads and large manufacturers wind up the year's business. The Boston Elevated

Philadelphia, Dec. 28.—More activity is shown in iron and steel scrap. Two eastern mills after buying a large tonnage of steel at $16, delivered, reduced their offer to $15.75 and obtained some at that price. Another mill bought a large tonnage of bundled sheets and turnings at $13 and now is offering $12.50.

St. Louis, Dec. 28.—Some hand-to-mouth buying of iron and steel scrap consumers is reported, and some mills would contract for tonnage at present prices were dealers willing to accommodate them. The latter, however, are generally anticipating an advance in prices immediately following the first of the year, and do not care to commit themselves.

Birmingham, Ala., Dec. 28.—Dull conditions in iron and steel scrap continue. New business is being placed slowly. Quotations are low and unsteady.

Sheets

Orders for Prompt Shipment More Numerous—Market Continues to Show Soft Spots

MORE activity is noted in the sheet market. Numerous orders are for prompt shipment, contracting being light. The automotive industry continues to release good tonnages. Chicago makers report a satisfactory close of an exceptionally good year. Prices show considerable variation, as much as $2 to $7 on black sheets for immediate delivery.

SHEET PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Despite the holiday, incoming sheet business is maintained at a high rate, the aggregate in new business for five days of last week exceeding the total new business for the six days of the preceding week, in several instances. Some of the protections on small and fair sized lots of sheets for car builders have developed into orders and additional protections have been granted. The latest involves 3500 to 5000 tons of galvanized sheets for 1000 refrigerator cars. Some blue annealed sheets have been ordered in lots of several hundred tons at a time by coal interests. Automotive sheet releases have been augmented this week. Sheet mill operations of the American Sheet & Tin Plate Co. up to Thursday night were on a 73 per cent basis. Competition is less drastic on galvanized and blue annealed but is keen on black. Prices $2 below the maximum quoted figures still prevail on everything except full finished. In connection with black sheets, one or two companies have on occasion cut below 3.00c.

Buffalo, Dec. 28.—Sharp competition is noted for first quarter sheet business. On large lots of black sheets 3.00c, Pittsburgh, is quoted, and there are reports of lower prices, although some makers are asking 3.10c. First quarter specifications are coming out freely.

Chicago, Dec. 28.—Sheet mill operations in the district are continuing at a good rate over the holiday season. The leading independent producer, after the shutdown over the Christmas week-end, resumed with all its mills at Indiana Harbor the first of the week. Its ten Milwaukee mills will be closed for repairs several days, but will resume in full. Little loss of time will result over the New Year holiday. Some forward buying is developing. Deliveries on heavy orders for shipment the first ten days in January must be deferred. The leading producer in this district reports production and shipments the best in any year on record. Steel roofing business in each of the last five months of this year has surpassed each of the normal months of 1925. September and October were the largest months in sheet roofing sales of any months in years. Quotations continue steady for first quarter.

St. Louis, Dec. 28.—The sheet market is dull, though prices are well maintained. Producers and distributors

are looking for improvement following the first of the year.

Boston, Dec. 28.—Sheets are soft and demand meager at Boston. One seller reports a drop of nearly 50 per cent in tonnage placed during the past week. Galvanized sheets are offered at 3.85c, Pittsburgh, and black sheets at 3.00c.

Youngstown, O., Dec. 28.—The low point in the rate of sheet mill operations in this district likely is being passed this week. The present rate of inflow of new business, and releases on old contracts, indicates works resumption next week on a more liberal scale. Releases became operative in a number of instances Dec. 27 and shipments, especially of full-finished sheets, are beginning to mount. On common black sheets for immediate delivery, prices range from $2 to $7 a ton. On forward business the most general quotation is 3.10c, with a few making 3.00c for specifications in hand. Some variations also appear in prices of tin mill black, and on galvanized, but the price of 4.25c on full-finished material stands unchallenged. Sheet jobbers in eastern Ohio are getting the best volume of inquiry from the Middle West that they have had in two months. This indicates to mill owners a quick comeback in the sheet trade. They figure February will exceed January's business, and March will surpass February.

Cleveland, Dec. 28.—Sales by steel sheet makers in the past few days have been light. Some makers are down for inventories and holiday repairs and little effort is being made to push quick shipment sales. First quarter contracting has been slow in developing, although some makers have covered more than 70 per cent of capacity. Black sheets continue the weakest grade with open prices ranging from 2.90c to 3.10c Pittsburgh. Some small lots for first quarter have been booked at 3.10c, but 3.00c is the common market. The 2.90c quotation, and some lower prices named, have applied generally to distress or immediate shipment lots. Galvanized continues 3.85c to 3.95c and blue annealed 2.30c to 2.40c, the minimums representing the first quarter contracting level. Autobody sheets, although inactive, are quoted 4.25c. Furniture stock is in good demand.

Philadelphia, Dec. 28.—Sheet specifications are better, including a number for shipment immediately after Jan. 1. On the bulk of current business, 2.30c on blue, 3.00c on black and 3.85c on galvanized is being done, with shading noted only in exceptional instances. Several inquiries are out for tin mill black for first quarter, and apparently nothing less than 3.10c, Pittsburgh, is being quoted.

Amendments to the corporate articles of the Milwaukee Tank Works, 1615 Fratney street, Milwaukee, effect an increase in capitalization to $200,000, consisting of 1000 common and 1000 preferred shares, each with a par value of $100. E. A. Bienenstok is president.

Tin Plate

Mills Starting Out 1927 Shipments—Operations Remain High

TIN PLATE PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Good business still rules in tin plate, makers continuing to discharge their early 1927 obligations. Tin mill operating schedules remain high. The American Sheet & Tin Plate Co. continued to operate 100 per cent, its level for the month up until last Thursday night. From then on it became difficult to maintain schedules because of holiday celebrations.

Philadelphia, Dec. 28.—Several important tin plate tonnage for first quarter and first half still are unclosed in this territory. Stock list prices continue $4.75 to $5.

More electric power is required by the New Haven railroad, and to secure this a contract has just been placed with the Connecticut Light & Power Co. A new $200,000 station will be built at Devon, Conn. Power from this station will enable the railroad to add special trains on rush days without resorting to the use of coal burning locomotives.

Would Tax Foreign Made Machine Parts

Washington, Dec. 28.—Representative Bacon, of New York has introduced a bill in the house "to prohibit the importation free of duty of foreign made parts for use on American made machines." The bill, which has been referred to the house committee on ways and means follows:

"That foreign made parts imported into the United States or into any of its possessions (except the Philippine islands, the Virgin islands, and the islands of Guam and Tutuila) for use upon American made machines shall not be exempt from duty. This act shall take effect upon the day following its passage."

Pipe

Mill Deliveries Easier and Buyers Delay Ordering—Cast Market Continues Activity

LACK of recent buying has reduced steel pipe mill backlogs and prompt deliveries on most sizes now are possible. No line pipe inquiries formally are pending, although a number tentatively are being negotiated. Cast pipe continues unusually active for the season. Brooklyn, N. Y., closed on 6000 tons, Philadelphia on 5000 tons and Detroit 2000 tons. Boston inquiring for 3000 tons.

PIPE PRICES, PAGE 1696 AND 1732

Pittsburgh, Dec. 28.—Pipe buyers can obtain almost any reasonable tonnage promptly and consequently they defer buying until mandatory. The delivery situation has eased considerably, even on lapweld. On buttweld, shipments from mill stocks usually can follow receipts of orders, but on lapweld a little more time is needed. No formal inquiries for lines are pending but a number are scheduled to appear shortly after the first of the year. Pipe mill operation is averaging about 75 or 80 per cent.

Boston, Dec. 28.—Several gas companies are about to close on round tonnages of cast iron pipe. One is taking bids on 3000 tons. Practically no municipal awards have been let. Prices are unchanged.

New York, Dec. 28.—Closing of approximately 11,000 tons by public utilities companies in Brooklyn and Philadelphia and the inquiry for 3000 tons by Boston feature the eastern cast pipe market. Prices show a sagging tendency, with 6-inch and over now holding at $49.50 to $51.60 and 4-inch at $53.50 to $55.60.

Chicago, Dec. 28.—Cast iron pipe quotations continue easier at $38 to $39, base, Birmingham, for 6-inch and over, or $46.20 to $47.20, Chicago. A few tonnages are reported at slightly above the $39 base price, while more attractive lots for immediate shipment are quoted at $38. A fair number of sales of three to four carload lots appear, but public lettings are scarce. Operations of pipemakers will be suspended until Jan. 3. It is reported that about 2000 tons of centrifugal pipe for Detroit has been divided among American Cast Iron Pipe Co., United States Cast Iron Pipe & Foundry Co. and National Cast Iron Pipe Co.

Birmingham, Ala., Dec. 28.—Cast iron pressure pipe production is scheduled for resumpton next week. The market is quiet but unfilled tonnage will call for operation of shops at more than 60 per cent capacity. Quotations are unchanged at last week's level of $36 to $37 on 6-inch and over sizes. Soil pipe trade shows no improvement but several of the larger producers have orders enough to start in full force next week.

CONTRACTS PLACED

6000 tons, Brooklyn Union Gas Co., Brooklyn, N. Y., placed, fully 2500 tons going to Donaldson Iron Works.

5000 tons, Boston Consolidated Gas Co., Boston, previously noted as having been placed, was divided between Warren Foundry &

Pipe Co. and Donaldson Iron Works.
5000 tons, United Gas Improvement Corp., Philadelphia, placed with unstated maker.
3650 tons, cast pipe for Portland, Oreg.; bids in Jan. 3.
671 tons, 8 to 12-inch class B and D, for Glendale, Calif., to National Cast Iron Pipe Co.
408 tons, 16 and 20-inch class B, for Glendale, Calif., to American Cast Iron Pipe Co.
27,000 feet, cast pipe for Bellingham, Wash.; bids in Jan. 6.
6100 feet, Class B sand pipe, for Seattle; bids in Jan. 7.
2000 feet, 12-inch class B pipe, Snohomish, Wash., through Pacific Water Works Supply Co., to foreign interest.

CONTRACTS PENDING

3000 tons, Boston; bids close Dec. 30.
217 tons, 6 to 16-inch class B and C, Santa Barbara, Calif.; bids in Jan. 4.
204 tons, 8-inch class B, Redwood City, Calif.; bids postponed to Jan. 3.

Culvert Research Body Changes Name

Armco Culvert and Flume Manufacturers' association will change its name to the Armco Culvert association, effective Jan. 1. The association will continue to devote its efforts to research in drainage and irrigation and to educational publicity making result of the research known.

Crane Builders Organize

Practically the entire capacity of the overhead electric crane industry is represented by membership in the Electric Overhead Crane institute. formation of which was completed in Washington a few days ago. At an organization meeting held in Cleveland, Oct. 19, the group tentatively had adopted the name of the Crane Manufacturers' association.

As reported on page 1061 of the Oct. 21 issue of IRON TRADE REVIEW, officers of the new organization are: President, Henry W. Standart, president, Northern Engineering Co., Detroit; vice president, Frank A. Hatch, general manager, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.; and secretary-treasurer, S. Buckley, Niles Crane Corp., New York.

Members of the institute are: Alliance Machine Co., Alliance, O.; Cleveland Crane & Engineering Co., Wickliffe, O.; Morgan Engineering Co., Alliance, O.; Milwaukee Electric Crane & Mfg. Corp., Milwaukee; Box Crane & Hoist Corp., Philadelphia; Harnischfeger Corp., Milwaukee; Manning, Maxwell & Moore Inc., New York; Niles Crane Corp., New York; Whiting Corp., Harvey, Ill.; Northern Engineering Co., Detroit; and Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

Stutz Motor Car Co. of America, and the Van Camp Hardware & Iron Co., both of Indianapolis, gave their employes five per cent of their salaries as a Christmas present. The distribution was made two days before Christmas and came as a surprise to the employes.

Bars

Decided Increase in Buying Marks Closing Week of Year, at Firm Prices

INCREASING activity of steel bar consumers in various lines has cast its influence on the final week of the year, in preparation for better January operation. Mills are feeling the call in larger specifications and spot buying continues steady. Forward buying still lags but some tonnage has been covered at the same price as for December.

BAR PRICES, PAGE 1696

Chicago, Dec. 28.—Soft steel bar sales and specifications moved actively in the preholiday pick-up of spot business, miscellaneous sales during the week having surpassed by 50 per cent those of the week preceding. Specifications against contracts in the same period advanced 15 per cent over those of the week before. Automotive builders, desiring to have some of their needed material in shipment before the close of the year, are leading in the buying which extended over the Christmas holiday. Farm implement users are marking time for the present, pending more definite shaping of the agricultural outlook. While shapes and plates made less of a jump in spot business, the aggregate spot demand for finished steel has exceeded earlier expectations for this season. Shipments of bars continue steady and records for December are expected to show a rate equivalent to that of November, although they likely will be slightly behind December of last year, which was one of the peak months of 1925. Little forward buying is in sight, except on alloy steel bars, for which some first quarter contracting has been closed. Mills are quoting 2.10c, Chicago, for first quarter business, and this price is expected to hold.

Pittsburgh, Dec. 28.—Merchant steel bar jobbers who have been operating within close stock limits to keep down inventories are now actively specifying. Cold finishers, having received releases from automotive customers, immediately find it necessary to call upon the merchant steel bar makers for added supplies. This is causing a fair degree of activity during the closing week of the year, which undoubtedly will be increased in January. Some additional contracts have been signed for first quarter at 2.00c.

Piecemeal buying holds the center of the stage in refined iron bars. Small orders bring 2.90c to 3.00c.

Cleveland, Dec. 28.—Soft steel bar users display a shade more interest. Last week's bookings by one important maker were the best since late November. By the end of this week fair shipments will be in transit to many consumers who need the material urgently as January opens. Improvement in the automobile industry will come slowly, but confidence is expressed that the industry will come back next month. The belief is gaining ground that bar makers without production in Cleveland will meet, at least in part, the competition of Cleveland mills who have been quoting bars at 2.00c, Cleveland, and doing even less on attractive business. A Cleveland base is considered one possibility; another is a base at the nearest point of production. It is reported that several long-time contracts have been closed by a Cleveland mill.

Youngstown, O., Dec. 28.—Slight improvement in the volume of new business being done in steel bars is noted by local mills which gives promise of better rates of bar mill operations in January than were possible in December. Quotations remain at 2.10c Pittsburgh, for small lots and 2.00c for larger quantities.

Boston, Dec. 28.—Steel bar demand has further declined. Mills offer prompt delivery. Despite this no shading of the 2.00c, Pittsburgh, level has come to light except in the case of small lots of foreign material which are insufficient to affect the market.

Philadelphia, Dec. 28.—Steel bar demand has improved materially. Good orders were received, particularly last Thursday and Friday. The market is firm at 2.00c, Piitsburgh.

Hoops and Bands

Hot Rolled Flat Makers Find Considerable Tonnage in Narrow Sizes

HOOP PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Hoop and band orders still represent a great deal of the tonnage coming to hot rolled flat makers. Automotive demand is improving and other consuming lines are maintaining output at a relatively high rate. The price is firm at 2.50c.

Announces Meeting

The spring meeting of the American Electrochemical society will be held at the Benjamin Franklin hotel, Philadelphia, April 28-30 and will mark the twenty-fifth anniversary of the society's organization. Elaborate plans are being made for the celebration.

At the regular quarterly meeting of the New England council, held recently at Providence, R. I., Henry D. Sharpe of Brown & Sharpe Mfg. Co., Providence, was re-elected chairman of the Rhode Island group.

Structural Shapes

Awards Continue Scattered and Small as Holidays Cut Into Market Activity—Chicago Apartments Take 25,000 to 30,000 Tons

AWARDS of structural shapes were featured by 12,000 tons for a bank building in Chicago last week. Orders and inquiries are few and scattered as buyers defer action until January. Pending work indicates good first quarter business if a fair proportion is placed. Apartment house projects pending in the Chicago district will require from 25,000 to 30,000 tons. Several large buildings for New York are being carried over into the first quarter. Plain material contracting has been developing slowly, assurance of continued stability in prices and promptness of deliveries eliminating the necessity for buyers to cover far in advance. Plain material is unchanged at 2.00c, Pittsburgh, equivalents, and 2.10c at Chicago. Fabricated competition remains keen.

STRUCTURAL SHAPE PRICES, PAGE 1696

New York, Dec. 28.—While awards are scattered, structural tonnage now active points to substantial revival shortly after the turn of the year. Several jobs, ranging 2000 tons and over, are scheduled for early action. Competition has resulted in easier prices on fabricated material. The market cannot be described as weak and for plain material a range of 1.90c to 2.00c, Pittsburgh, continues the rule.

Boston, Dec. 28.—Five or six structural awards at Boston during the past week averaged 50 tons each. The general contract for a 23-story building at Providence, R. I., has been let and a fair amount of steel work is in prospect for January. Prices are firm at 2.00c, Pittsburgh, or 2.365c, delivered.

Pittsburgh, Dec. 28.—Between the holidays, the structural shape market has been quiet. The largest award of the week is the local California avenue bridge, 2000 tons, which went to Fort Pitt Bridge Works. Shapes are firm at 2.00c, and additional contracts for first quarter have been written. Deliveries are from three to five weeks deferred.

Cleveland, Dec. 28.—No inquiries of attractive size were brought before local fabricators in the past week. Awards included several projects between 50 and 100 tons but larger orders were lacking. First quarter contracting continues without much life. Prices on plain material are well established at 2.19c, Cleveland, or 2.00c, Pittsburgh.

Chicago, Dec. 28.—Awards of structural material here were featured by 12,000 tons for the State Bank building. Inquiry for structural material for 1000 to 1500 tons is active. Considerable material will be needed for factory building and apartment house construction in the Middle West, and a large number of projects in the Chicago district are pending. These latter will require from 25,000 to 30,000 tons. Little forward contracting is being done. The quotation for first quarter business is 2.10c, Chicago.

Philadelphia, Dec. 28.—Shape demand is light, eastern makers operating only 50 per cent. Lower prices have appeared on unusually attractive tonnages. The usual range is 1.85c to 2.00c, Pittsburgh.

Awards Compared

	Tons
Awards this week	33,340
Awards last week	18,737
Awards two weeks ago	78,401
Awards this week in 1925	28,734
Average weekly awards, Nov.	27,631
Average weekly awards, 1926	28,684
Total awards to date, 1925	1,702,170
Total awards to date, 1926	1,496,248

CONTRACTS PLACED

12,000 tons, State Bank of Chicago, to American Bridge Co.

3100 tons, highway bridge, Twin Falls, Idaho, to Wallace Bridge & Structural Steel Co.

3000 tons, first unit of Tudor village, along the East river, New York, awarded through Fred F. French, to Hedden Iron Construction Co.

2000 tons, California avenue bridge, city of Pittsburgh, to Fort Pitt Bridge Works.

1500 tons, freight depot, Chicago & North Western railroad, Proviso, Ill., to American Bridge Co.

1250 tons, viaduct, Jersey City, N. J., to an unnamed fabricator.

1100 tons, bridge for Erie railroad, to American Bridge Co.

1070 tons, memorial civic coliseum, Cedar Rapids, Iowa, to Iowa Steel & Iron Works.

820 tons, theater, Springfield, Mass., to Palmer Steel Co.

800 tons, 16-story apartment, West Eighty-sixth street, New York, to Easton Structural Steel Co.

750 tons, state highway bridge, Salem, N. J., to Phoenix Bridge Co.

700 tons, garage, Cortland street, New York, to a local fabricator.

625 tons, school No. 132, Queens, New York, to Bethlehem Fabricators, Inc.

625 tons, school No. 123, Queens, New York, to Bethlehem Fabricators Inc.

500 tons, girder spans for Northern Pacific railroad in Oregon, to American Bridge Co.

500 tons, school No. 117, Jamaica, Long Island, N. Y., to Easton Structural Steel Co.

485 tons, Farwell building, Chicago, to Hansell-Elcock Co.

375 tons, Philadelphia General hospital addition, Philadelphia, to local fabricator.

375 tons, subway station, Philadelphia, to McClintic-Marshall Co.

360 tons, rebuilding No. 2 blast furnace at South works, Illinois Steel Co., South Chicago, Ill., to John Mohr & Sons.

300 tons, including 80 tons for Bryant Heater & Mfg. Co. building, Cleveland, and pump house for Standard Oil Co. of Ohio, Cleveland, to T. H. Brooks Co.

250 tons, house of correction, Philadelphia, awarded to a local fabricator.

200 tons, Glencourt office building for Pacific Telephone & Telegraph Co., San Francisco, to California Steel Co.

160 tons, including 100 tons for by-product furnace lining and flue supports for shipment to West Virginia for Chapman-Stein Furnace Co., Mt. Vernon, O., and 60 tons for a store and office building at Cumberland, Md., to Pittsburgh-Des Moines Steel Co.

135 tons, M. A. Hanna Co., headframe for Hiawatha mine, Iron River, Mich., to Worden-Allen Co.

130 tons, Minnesota General Contractors, Inc., Minneapolis, various state bridges in Minnesota, to American Bridge Co.

130 tons, building for Keystone Steel & Wire Co., Peoria, Ill., to Mississippi Valley Structural Steel Co.

100 tons, building for Associated Oil Co., Emeryville, Calif., to Judson Mfg. Co.

100 tons, miscellaneous work, Pittsburgh district, to W. N. Kratzer Co.

100 tons, music building for Lake Erie College for Women, Painesville, O., through Crowell & Little Construction Co., Cleveland, reported awarded to unstated fabricator.

CONTRACTS PENDING

5000 to 6000 tons, estimated for Lackawanna railroad drawbridge, Port Newark, N. J.; specifications expected out within fortnight.

5000 tons, Press club building, Chicago; plans being prepared.

5000 tons, approximately, Panco building, Chicago; pending.

3000 to 4000 tons, estimated, 34-story state office building, Albany, N. Y.; bids to be opened Jan. 8.

2500 tons, amusement pier, Asbury Park, N. J.; bids asked.

1000 tons, Shark river bridge, New Jersey; Parker & Graham Co., low bidder.

600 tons, two plant buildings for Western Electric Co., Kearny, N. J.; bids asked.

350 tons, warehouse for Armstrong Cork Co., Beaver Falls, Pa.; bids closed Dec. 28.

350 tons, office building, Hartford, Conn.; bids asked.

350 tons, professional building, addition, Hanson place, Brooklyn, N. Y.; pending. This was previously noted as involving an unstated tonnage.

225 tons, Morgan library, Madison avenue, New York, bids asked.

150 tons, construction for Standard Oil Co. of New Jersey, Bayonne, N. J.; bids asked.

Stack Will Be Rebuilt

Chicago, Dec. 28.—The contract for rebuilding the No. 2 blast furnace of the Illinois Steel Co., South works, South Chicago, Ill., has been awarded to John Mohr & Sons, Chicago. No. 2 stack has been shut down for some time. The reconstruction will require approximately 360 tons of steel.

At the meeting of the Pittsburgh Foundrymen's association to be held in the Fort Pitt hotel, Pittsburgh, Jan. 17, F. B. Miller, sales manager, Keystone Coal & Coke Co., will deliver

an address on "Coke—What It Is and How It Is Made." The lecture will be illustrated completely by lantern slides, and in addition there will be a group discussion on foundry foreman training under the direction of Pennsylvania State college.

Machinery Exports Gain

Industrial machinery exports of the United States in November amounted to $14,795,984 and were an increase of 27 per cent over the $11,682,604 in October and 19 per cent over the $12,421,865 of November, 1925, according to statistics compiled by the industrial machinery division of the department of commerce, Washington. The November shipments bring the total exports for the 11 months of 1926 to $143,080,000, as compared with $134,891,000 for the corresponding period of last year. The increase is $8,000,000. Shipments of metalworking machinery for the 11 months amounted to $17,388,727, against $20,044,824 for the same period of 1925, the decline being 15 per cent.

Exports Value Increases

Washington, Dec. 28.—Exports in November 1926 were valued at $481,000,000 compared with $448,000,000 in November 1925, an increase of $33,000,000. While the figures are preliminary and few details are as yet available it is known that this increase occurred in the face of a reduction, due chiefly to lower prices, of approximately $27,000,000 in the value of raw cotton exported during the month. In other words, commodities other than cotton showed an increase of about $60,000,000. This increase was widely distributed among different commodities. Increase of about $25,000,000 from October to November, 1926 was also generally distributed among numerous commodities.

Reinforcing Steel Body Helps Publicity

Washington, Dec. 28.—The Concrete Reinforcing Steel institute has ordered through the government printing office 2000 copies of simplified practice recommendation No. 53, for steel reinforcing spirals. These are to be distributed among members of the institute. This co-operation is much appreciated by the department of commerce, as the distribution of these pamphlets will bring the simplified line to the attention of a large group of manufacturers and others interested.

Spain Ends Ore Duty

Washington, Dec. 28.—The Spanish government has abolished export duties on iron ores, effective Dec. 9, 1926, according to a cable to the department of commerce from Commercial Attache C. H. Cunningham. At the same time the transport tax on iron ore and copper pyrites was reduced by one-fifth.

The former export duty on iron ore was 0.20 gold peseta per ton.

Concrete Bars

Sluggish Activity Broken by Several Good Awards—Develop Weakness in Prices

ACTIVITY in the concrete reinforcing bar market during the past week was featured by award of 1400 tons for an insurance building annex in Cincinnati. Awards and inquiries were limited in number and size. First quarter contracting by fabricators with mills has been slow in developing. Mill prices continue to reflect weakness as shading becomes more prevalent.

REINFORCING BAR PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Builders are sluggish in placing contracts for reinforcing concrete bars needed on local jobs. Only a few small tonnages have been awarded in this territory. Few inquiries have come out. The generally quoted market figure is 2.00c. Some square twisted bars are understood to be involved in the California avenue bridge on which the structural steel was let this past week.

Boston, Dec. 28.—With small sales the rule and inquiry meager, concrete bar prices show greater strength at Boston. The warehouse level on small sizes has now moved up to 3.00c.

Buffalo, Dec. 28.—First quarter sales of reinforcing bars have been small to date but inquiry is increasing. One 500-ton lot will be wanted soon for a Buffalo elevator project and several other fair sized inquiries are pending. Tonnage for shipment direct from mills is quoted at 2.265c and mill stock lots are selling at 2.75c, delivered Buffalo.

Cleveland, Dec. 28.—Awards of concrete reinforcing bar contracts in the past week were confined to a few small lots. Buyers are delaying action until January. Inquiry was almost entirely lacking, but a good aggregate of pending work remains unplaced. Competition offered by local makers has brought the new billet bar price down to 1.90c, Cleveland, although producers from outside this district still maintain a minimum of 2.00c, Pittsburgh. Rail steel quotations of 1.80c, mill, are untested.

Chicago, Dec. 28.—Spirited competition for reinforcing bar business is developing weakened prices. Rail steel bars are quoted at 1.90c to 2.00c, while billet bars range from 2.25c to 2.60c. Some billet bar tonnage recently figured below 2.25c. Awards are light, the winter weather having interfered with concrete construction work. Difficulty in financing has held up several projects which have been pending for a long time.

Awards Compared

	Tons
Awards this week	4,845
Awards last week	2,313
Awards two weeks ago	3,415
Awards this week in 1925	4,725
Average weekly awards, Nov.	6,208
Average weekly awards, 1926	6,245
Total awards to date, 1925	310,765
Total awards, to date, 1926	323,338

CONTRACTS PLACED

1400 tons, building annex for Union Central Life Insurance Co., Cincinnati, through Ferro Concrete Construction Co., general contractor, to Bourne-Fuller Co.
1345 tons, Lasher building, Philadelphia, to Truscon Steel Co.
500 tons, Chicago & Alton railroad requirements, to Concrete Engineering Co.
500 tons, Zellerbach Paper Co., warehouse, San Francisco, to unstated San Francisco jobber.
200 tons, 9-story studio building, Seattle, through Stebinger Bros., general contractor, to Mercer Steel Products Co.
175 tons, Atlantic & Pacific warehouse, Fifty-seventh street and Grove avenue, Chicago, to Barton Spider-Web System.
150 tons, apartment house, Kenmore avenue, Chicago, to Calumet Steel Co.
150 tons, Sherman school, San Francisco, to Gunn, Carle & Co.
125 tons, Y. M. C. A. building, Hoboken, N. J., to McClintic-Marshall Co.
110 tons, building for municipality of Manizales, Colombia, S. A., to a European mill. Contractors, Ulen & Co., New York.
100 tons, warehouse for Standard Sanitary Mfg. Co., Altoona, Pa., through the Columbia Construction Co., general contractor, to Truscon Steel Co.
100 tons, addition to Dolomite Co. plant, Rochester, N. Y., to Kalman Steel Co.
100 tons, warehouse for Libby, McNeill & Libby Co., Sacramento, Calif., to unstated San Francisco jobber.

CONTRACTS PENDING

1000 tons, Kittitas irrigation project, Seattle; bids in next week.
500 tons, superstructure, International Milling Co., Buffalo, bids early in January. In addition to 100 tons recently placed.
275 tons, Cleveland Bonded Warehouse Co. building, Cleveland; again revived and Sam W. Emerson Co., general contractor, expected to take bids in January.
115 tons, Dunham & Reid warehouse, New York; architect, George S. Kingsley.
100 tons, city hall addition, Newark, N. J.; pending.
100 tons, additional for Wharf at Kalului, T. H., to E. J. Loyd, general contractor.
100 tons, crematorium, San Matoe, Calif.; bids being taken.
100 tons, crematorium, Oakland, Calif.; bids being received.
100 tons, warehouse for Blake, Moffit & Towne, Sacramento, Calif.; bids received.
100 tons, Southern Bookbinding Co. building, Philadelphia; pending.
Unstated tonnage, square twisted bars, California avenue bridge, city of Pittsburgh; bids being taken.
Unstated tonnage, building for Goodrich Rubber Co., Akron, O.; bids being taken.

Class one railroads on Dec. 8 had

164,580 surplus freight cars in good repair and immediately available for service, the American Railway association announces. This was an increase of 19,659 cars compared with Nov. 30 at which time there were 144,921 cars. Surplus coal cars on Dec. 8 totaled 15,335, an increase of 2814 cars within approximately a week while surplus box cars totaled 114,-182, an increase of 15,388 cars for the same period.

Bonus Payments Graded to Length of Service

New York, Dec. 28.—An interesting bonus arrangement has been completed by David H. Smith & Sons, Inc., Brooklyn. Employes will be given a bonus of one week's wages for one year of service; two weeks' wages for two years of service; three weeks' wages for three years of service; four weeks' wages for four years of service and five weeks' wages for service of five or more years. In place of a cash bonus, employes may elect to receive stock on the basis of one and one half shares of stock for each $100 of bonus and the remainder to be paid in cash. The par value of common stock of this company is $100 and for the past three years this stock has paid 8 per cent dividends.

Will Replace Hot Mills

Early next year the J. Wood department at the Schuylkill Iron Works division of the Alan Wood Iron & Steel Co., Conshohocken, Pa.. will be dismantled. The plant built in 1832 by J. Wood & Bros,, includes two sheet mills. These will be replaced by modern hot mills for installation at the Schuylkill division.

Malleable Output Slumps

Washington, Dec. 28.—Production of malleable castings in November, reported to the department of commerce by 139 plants, totaled 45,793 tons, the lightest since September 1924, when 41,507 tons were produced. Bookings fell to 40,294 tons in November. Operations in November were 42.7 per cent, the first that they had fallen below 50 per cent since August 1925. Further comparisons follow:

1925	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
November	60,800	55.1	55,552	110,273
Total (11 mos.)	671,766	54.0	599,242	1,243,983
December	65,766	59.0	53,991	111,332
1926				
January	75,658	68.2	65,738	110,824
February	66,401	59.2	58,379	110,895
March	74,520	67.4	70,198	110,539
April	66,733	60.4	52,649	110,415
May	60,128	55.2	49,179	**108,891
June	61,023	55.3	45,548	**110,228
July	55,555	51.1	55,766	**108,655
August	57,541	52.7	48,922	**109,161
September ..	58,376	53.7	47,130	**108,627
October	57,175	52.6	45,490	**108,638
November	45,793	42.7	40,294	**107,185
Total (11 mos.)..	618,913	56.4	567,898	1,204,058

**Capacity since May has been based on following formula: "Total number of units of molding floor space, times average production per molder per day per unit of floor space, times number of actual working days per month."

Rails, Cars

Rail Orders Total 15,000 Tons and Track Fastening Inquiry 20,000 Tons

ACTIVITY in the railroad market during the past week was confined to small lots. Rail orders in the Chicago district totaled 15,000 to 20,000 tons, including accessories. Inquiries for track fastenings totaled 18,000 to 20,000 tons. Car builders continue to expect several large awards before the year end. Locomotive inquiries include lots of 50 and 46.

RAILROAD TRACK MATERIAL PRICES, PAGE 1696

Pittsburgh, Dec. 28.—December tonnage in light rails was larger than any month of the year by 10 to 15 per cent. Orders kept up well from coal mines, although individual lots all were small. The $36 price is well maintained, with $2 less applying upon the rerolled product.

Spike and tie plate makers and manufacturers of other track accessories, are encountering a quiet market.

New York, Dec. 28.—Car builders continue to figure on a heavy volume of business. Awards for the first three weeks amounted to approximately 6000 freight cars, of which 575 will be built by the railroads themselves.

Reading railroad is taking bids on a large tonnage of tie plates.

Chicago, Dec. 28.—Chicago mills booked 15,000 to 20,000 tons of rails, including frogs and switches, the past week for four roads with terminals in Chicago. Inquiry for track fastenings continues heavy, while bookings in this district the past week totaled 18,000 to 20,000 tons for four roads, two of which are eastern carriers. Pressure by the railroads for delivery of track materials after the first of the year is expected to speed up rail mill operations to capacity sooner than had been expected. More inquiry for rails is expected in the next few weks. Buying of light rails is not heavy.

CAR ORDERS PLACED

Conley Tank Car Co., 100 tank cars, to American Car & Foundry Co.

Denver & Rio Grande Western, four dining cars, to American Car & Foundry Co.

Louisville, Henderson & St. Louis, 15 stock cars, to American Car & Foundry Co.

New York Central, 10 automatic dump cars, to Clark Car Co., in addition to the 20 previously noted as placed with this builder, and 10 to Koppel Industrial Car & Equipment Co.

Norfolk & Western, three dining cars, to Pullman Car & Mfg. Corp.

LOCOMOTIVES PLACED

A. Guthrie & Co., six mining locomotives, to General Electric Co.

New York, New Haven & Hartford, ten mountain type, to American Locomotive Co.

Nickel Plate, four mountain type, to American Locomotive Co., in addition to those recently placed.

Pere Marquette railroad, ten Mikado type locomotives, to American Locomotive Co., in addition to those recently placed.

Western Maryland, 20 freight locomotives, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Barber Asphalt Co., 200 tank cars; pending.

LOCOMOTIVES PENDING

Jersey Central railroad, 50 locomotives; pending.

Missouri-Pacific, 46 locomotives; pending.

Beehive Coke Production Still Declining

Beehive coke output registered another decline in the week ended Dec. 18, going to 183,000 tons compared with 184,000 tons in the week preceding, but for the year to date output is 11,201,000 tons, against 10,214,-000 in the same period of 1925. The bureau of mines, Washington, reports bituminous coal production in the week ended Dec. 18 at 13,220,000 tons, compared with 14,090,000 tons in the preceding week.

ESTIMATED PRODUCTION OF BEEHIVE COKE
(Net tons)

	—Week ended— Dec. 18, 1926b	Dec. 11, 1926c	1926 to date	1925 to date a
Pennsylvania and Ohio	149,000	148,000	9,100,000	7,898,000
W. Virginia	15,000	15,000	751,000	624,000
Ala., Ky., Tenn., and Ga.....	4,000	6,000	586,000	904,000
Virginia	6,000	6,000	341,000	366,000
Colorado and New Mexico	5,000	5,000	250,000	234,000
Washington and Utah	4,000	4,000	173,000	188,000
United States total	183,000	184,000	11,201,000	10,214,000
Daily average	31,000	31,000	38,000	35,000

(a) Adjusted to make comparable the number of days in the two years. (b) Subject to revision. (c) Revised since last report.

Rails Aid Sydney Works

Washington, Dec. 28.—Large orders for rails needed by various Canadian railways are causing the steel plant at Sydney N. S., to enjoy a very prosperous season, says a report to the department of labor. More than 2800 steel workers have been engaged and are expected to be retained through to the spring season.

The Market Section

Wire

Releases by Jobbers Give Some Activity—First Quarter Contracts Coming in

LITTLE change has taken place in the situation as to wire and wire products, though better activity has appeared in some respects. Production still is about 50 per cent of capacity. Railroad buying is better, jobbers are specifying better than for some time and some plain wire contracts have been written in the East.

WIRE PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Within the past few days, some fairly attractive jobber specifications on wire products have been released so that if the present ratio of business continues January shipments will be much heavier than in December. In addition, several plain wire contracts have been written for first quarter. Operations still stay within a few points of 50 per cent on the average. Base prices are firm, 2.50c on plain wire and 2.65c on wire nails.

Chicago, Dec. 28.—Forward buying of wire products is proceeding slowly. Specifications from the jobbing trade show little strengthening, but railroad buying has been picking up. December shipments of wire and wire products are behind those of November. Prices are steady.

Boston, Dec. 28.—Current sales are slow but first quarter contracts are being entered along encouraging lines. Operations of wire mills hold between 50 and 60 per cent of capacity. Plain wire is unchanged at 2.65c, Worcester.

Bolts, Nuts, Rivets

Specifications Improve Slightly and Prices Are Being Maintained

NUT AND BOLT PRICES, PAGE 1696

Chicago, Dec. 28.—Implement makers are increasing specifications for bolts and nuts, but this business is spotty. Railroad requirements are light. First quarter contracting is near completion. Only the larger buyers have held back on their first quarter contracts. More than 85 per cent of the minimum tonnage contracted for fourth quarter will be shipped, it is estimated.

Pittsburgh, Dec. 28.—Nut, bolt and rivet manufacturers have been favored for several months with fairly large tonnages for projects erected in their immediate vicinity. These include the Manchester, Point, Liberty and several other bridges. The latest to be awarded, the California avenue bridge, requiring 2000 tons of steel, will involve about 100 tons of rivets. Nut and bolt manufacturers are maintaining prices, giving an extra 5 per cent to jobbers, and the same preferential figure being granted the carload buyer. Rivet makers find that while 2.60c is the quoted market price, 2.50c often has to be done and sometimes less in order to obtain a share of the going business. Operations vary between 50 and 55 per cent.

Cleveland, Dec. 28.—December specifications for bolts, nuts and rivets are continuing to be fairly heavy for the inventory period of the year. One maker reports the present month's business to be on a level with that of November. The average for December in general will show the normal falling-off from November. Bookings for first quarter are progressing well. Contracts are being signed on the basis of quotations of fourth quarter.

Strip Steel

Buying of Cold Strip Slow, While Hot Grade Is Active

STRIP PRICES, PAGE 1696

Pittsburgh, Dec. 28.—Selling of cold strips on the 3.40c base, minus certain differentials for quantities, as noted last week, is by no means universal and real activity is lacking. On the other hand, because 2.30c continues firm and stabilized in hot, orders are fairly numerous. Only a little contracting ahead is being done, but some releases against old orders for automobile industries have come through, enabling makers to maintain 50 per cent schedules on cold. The average on hot is about 60 per cent.

Cleveland, Dec. 28.—Demand for hot and cold rolled strip steel has been confined to small fill-in lots. Contracting for first quarter has been on a basis comparable to fourth quarter needs. Prices on hot strip continue firm at 2.30c on wide and 2.50c on narrow sizes. Cold finished strip, however, is variable with the market fairly well established at 3.25c, Pittsburgh. Large lots are obtaining concessions under that figure, and small, mixed tonnages are quoted as high as 3.50c. The attempt to stiffen the market made recently by Pittsburgh mills has not materially affected the local situation. Detroit automotive interests are opening up with releases on shipments.

The subcomittee for the heat treatment of tool steel of the American Society for Steel Treating recently has isued to the membership of the society a tentative recommended practice for the heat treatment of plain carbon and alloy steel die blocks.

Refractories

Shipments Slack as Mills Operate at Low Rate—Prospects Good

REFRACTORIES PRICES ON PAGE 1728

Pittsburgh, Dec. 28.—Shipments of refractories have been curtailed owing to slack operations of steel mills. Refractory kilns are operating at 50 to 60 per cent. Orders are mostly for repairs, with an occasional replacement lining for blast furnaces. New construction is limited, but additional coke ovens and one or two blast furnaces are prospects for early 1927. Some additional contracts for first quarter have been written. Prices are firm, No. 1 Pennsylvania fire clay being unchanged at $40 to $43. In connection with silica brick, $43 still is adhered to for the first quarter. The only price below that is in connection with arrangements entered into some time ago for fourth quarter when some users contracted for first quarter as well as the then prevailing price of $40. Chrome brick contracts are practically all signed up for the year at $45, and the same thing is true of magnesite at $65.

Cold Finished Steel

Better Specifications Coming After Inventories Are Completed

Pittsburgh, Dec. 28.—Specifications on cold finished bars for shipment in January have been fairly steady the past several days. Automobile companies are getting new models ready for the January shows and have to have certain material on hand. Cold bar finishers insist that nothing below 2.40c is being quoted for first quarter, a lower figure than that by $2 per ton applying only when the tonnage involved would justify such a preferential price. Operations average 50 to 60 per cent.

Alloys Await New Year

Cleveland, Dec. 28.—Buyers of alloy steels are awaiting the close of the holiday-inventory lull before specifying. Automotive parts manufacturers in this district are holding back shipping instructions pending development of production programs of builders. Not much activity in this field is expected until about Feb. 15, when the winter automobile shows will be over and spring demand more clearly determined. Prices are untested by current transactions and published quotations prevail.

The recent advance in electrochemistry was the subject of a talk by Dr. Colin G. Fink, professor of electrochemistry, Columbia University, before the Rhode Island section of the American Chemical society at Providence recently.

Nonferrous Metals

Light Buying Characterizes Holiday Market —Prices Are Easier But Change Little— Contract Shipments Fair

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Spot Straits Tin, N. Y.	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Dec. 22	13.57½	13.70	13.12½	67.62½	7.80	7.67½	7.02½	26.80	12.75	35.00
Dec. 23	13.55	13.70	13.12½	67.25	7.80	7.67½	7.02½	26.80	13.00	35.00
Dec. 24	13.52½	13.62½	13.12½	67.00	7.80	7.65	7.02½	26.50	13.12½	35.00
Dec. 27	13.50	13.65	13.12½	67.00	7.80	7.65	7.05	26.50	13.25	35.00
Dec. 28	13.50	13.65	13.07½	66.50	7.77½	7.62½	7.02½	26.50	12.62½	35.00

NEW YORK, Dec. 28.—Buying of nonferrous metals was unusually light during the past week but a holiday market had been expected. Meanwhile shipments are moving along at a fair rate and prices have changed little, though they are easy.

Statistics have shown more than average monthly world production of copper, lead and zinc in November, even in a year when annual production records are being broken. Consumption of all metals this year in the United States and in some other parts of the world will show a larger total than ever before, but probably by a smaller proportion over last year than the proportion of increase in output. Peak production has come near the season of most restricted buying. Yet stocks are light in proportion to turnover.

Copper—Some producers have eased their price on copper from 13.62½c, Connecticut, to 13.50c while others have refused to go quite so low. Sales at any price have been limited, as users have been fairly well covered through January and most producers have not been pressing the market. Midwestern prices have held nearer to 13.75c than has the eastern market to its base of a week ago. Some export business has been done at 13.95c c.i.f. Brass and copper products prices were cut ¼-cent today. Copper wire was cut ⅛-cent.

Zinc—Not much buying has been done but ever since the surprisingly strong November statistics of a few weeks ago, smelters have been fairly firm in their attitude. On Monday practically all of them asked 7.05c, East St. Louis for prompt prime western, some of them actually being firmer than a few days earlier, despite dullness. Shipments this month are likely to be smaller than last month but even so, smelters are in a good position to accumulate a little more stock.

Lead—A small amount of buying has been done from day to day but the market developed an easier tone today after holding well at 7.80c, New York, and 7.65c, East St. Louis for some time past.

Tin—Buying of tin has been light in the past week but moderate business was done on some days. After the market had fallen to 67.00c for spot and nearby Straits on Thursday and Friday and selling at this figure early Monday, it began to firm up again. Spot was the lowest since last September but futures lately were more steady than spot so that the premium on the latter nearly disappeared, with March delivery only about 1 cent under spot or January.

Aluminum—The open market now is 26.50c for 98-99 per cent, compared with the domestic producer's price and former open market price of 26.80c. Buying continues light, with users not caring to buy ahead now. The Aluminum Co. of America's prices are unchanged and so is the open market on 99 per cent at 27.00c.

Nickel—Prices of nickel for the new year are unchanged, so that for a year the market has been unusually steady. The International Nickel Co. has announced that it has increased the purity of its various forms of nickel.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	18.37½
Copper, hot rolled	22.00
Zinc, (100-pound base)	11.50
Lead full sheets (cut ¼c more)	11.75 to 12.25
Aluminum, bright flat, up to 10 gage	36.50
SEAMLESS TUBES	
High brass	23.25
Copper	24.00
RODS	
High brass (round ⅝ to 2½-inch)	16.12½
Naval brass	18.87½
WIRE	
Copper, small lots	15.50
High brass	18.87½

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	8.50 to 9.00
Chicago	8.75 to 9.00
Cleveland	8.75 to 9.50
HEAVY YELLOW BRASS	
Chicago	7.25 to 7.75
Cleveland	7.00
ZINC	
New York	4.25
Cleveland	4.50
HEAVY COPPER AND WIRE	
New York	10.87½ to 11.12½
Boston	10.00 to 10.75
Chicago	10.00 to 10.75
Cleveland	10.25 to 11.25
RED BRASS BORINGS	
New York	7.75 to 8.00
YELLOW BRASS TUBING	
Cleveland	6.50 to 7.00
LIGHT COPPER	
New York	8.75 to 9.00
Chicago	9.00 to 9.25
Cleveland	9.00 to 9.75
LIGHT BRASS	
Boston	5.25 to 5.75
Chicago	6.00 to 6.50
Cleveland	5.20 to 5.50
ALUMINUM	
Clippings, Cleveland	20.00
Borings, Cleveland	12.00 to 13.00
Cast, Cleveland	15.50 to 16.50
Cast, Boston	15.50 to 16.50

Secondary Metals

Remelt aluminum No. 12	21.50 to 22.00
Brass ingot, 85-5-5-5	11.62½ to 11.75

Coke By-Products

Sulphate of Ammonia Prices Firmer— Look for Naphthalene Buying

New York, Dec. 28.—Domestic prices on sulphate of ammonia have stiffened, now holding firmly at $2.50 against a range of $2.45 to $2.50, delivered, recently. The situation in the South, due to overproduction of cotton, apparently is adjusting itself satisfactorily and fertilizer interests are reflecting their confidence in the outcome by better buying. Export buying is quiet with prices unchanged at $2.55 to $2.60, port, for material in double bags. In fact, virtually all sellers are quoting $2.60, but it is believed that $2.55 can still be done.

Distillates are unchanged, with demand somewhat easier, reflecting the holiday and inventory season. Pure and 90 per cent benzol may be quoted at 23 to 24 cents, works, per gallon in tank car lots and 29 cents in drums; toluol and solvent naphtha, 35 cents, works, in tanks and 40 cents in drums; and commerical xylol 36 cents in tanks and 41 cents in drums.

Naphthalene may be quoted at 5 to7 cents, works, in flakes and 6 to 8 cents in balls. The drug trade is commencing to show more interest in its spring requirements and the placing of substantial contracts should begin shortly.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contract
Pure benzol	$0.23 to $0.24	
90 per cent benzol	0.24	
Toluol	0.35	
Solvent naphtha	0.35	(nominal)
Commercial xylol	0.36	(nominal)
Phenol	0.22	0.22

Per Pound at Producers' Plants

Naphthalene flakes	0.05 to 0.07
Naphthalene balls	0.06 to 0.08

Per 100 Pounds Delivered

Sulphate of ammonia	2.50	

Warehouse

Present Buying Light But Prospects Point to Resumption Within Another Week—Prices Subject to Few Variations

SEASONAL dullness is in full sway according to iron and steel warehouse interests. Although present buying is confined to minimum purchases, a resumption of activity is expected within a week to 10 days. Prices hold steady, with but slight tendency to shade being noted.

Affected by holiday and inventory seasons, jobbing demand in the New York metropolitan district is slack. Prospects promise an early revival. Prices are steady throughout the list.

The year is ending quietly among the warehouse operators at Pittsburgh although demand has been well sustained during recent weeks. Diversified orders have come through for quick deliveries by truck for many products. Sellers of sheets report a splendid movement of galvanized and blue annealed. Price levels are maintained and are as strong as they have been at any time during the year.

Seasonal factors are strongly in evidence in the St. Louis warehouse trade. Buyers are generally disposed to hold off on new buying and shipping directions until after inventory. The general manufacturing trade taking a fair tonnage. Aside from reinforcing concrete bars, demand from the building industry has fallen to small proportions compared with activity of the past several months.

Iron and steel warehouse business at Buffalo is at the low point of the year, as expected at this season. Prices have been firm this month, which is running close to December 1925, in volume of business.

Detroit warehouse operators are practically marking time until after inventories. With the automobile manufacturers planning on swinging into fair production shortly after the first of the year, the outlook for good business is considered favorable.

Cleveland jobbers have reduced activities the past week to harmonize with the curtailed buying of customers. Sales the past two weeks have slumped off, making December's total under that of the preceding month. Volume of business exceeds December, 1925, by a comfortable margin, and heavy sales are anticipated in January when manufacturers resume

(*Concluded on Page* 1711)

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles	3.30c
New York	3.24c
Philadelphia	2.80c to 3.20c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.80c to 4.06c

IRON BARS

Boston	3.265
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
Ft. Worth	3.75c
New York	3.24c
Philadelphia	2.90c to 3.20c
St. Louis	3.15c
Tulsa	3.80c to 4.06c

REINFORCING BARS

Boston	3.265 to 3.50c
Buffalo	3.30c
Chicago, billet	2.25c to 2.60c
Chicago rail steel	1.90c to 2.00c
Cincinnati	3.20c to 3.30c
Cleveland	2.50c to 3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles, C.L.	3.05c
Los Angeles, L. C. L.	3.30c
New York	3.15c
Philadelphia	2.90c to 3.15c
Pittsburgh	2.50c to 2.60c
San Francisco, C. L.	2.30c
San Francisco, L C. L.	2.45c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.50c to 2.60c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.25c
Ft. Worth	4.50c
Los Angeles	3.20c
New York	3.34c
Philadelphia	2.65c to 3.20c
Pittsburgh	3.00c
Portland	3.10c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.80c to 4.16c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.00c
Cleveland, 3/16-inch	3.225c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Ft. Worth	4.50c
Los Angeles	3.20c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.75c to 3.20c
Philadelphia, 3/16-inch	2.95c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.80c to 4.16c

NO. 10 BLUE ANNEALED SHEETS

Boston 3/16-inch	3.915c
Buffalo	3.80c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.65c
Los Angeles	4.00c
New York	3.89c
Portland	4.25c
Philadelphia	3.50c
Pittsburgh	3.40c
San Francisco	4.00c
Seattle	4.25c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.05c to 4.25c

NO. 24 BLACK SHEETS

Boston	5.10c
Buffalo	4.30c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.80c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.00c
New York	4.35c
Philadelphia	4.35c
Pittsburgh	3.95c
Portland	4.90c
San Francisco	4.90c
Seattle	4.90c
St. Louis	4.45c
St. Paul	4.20c
Tulsa	4.75c

NO. 24 GALVANIZED SHEETS

Boston	5.80c
Buffalo	5.15c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.05c
Ft. Worth	5.90c
Los Angeles	5.75c
New York	5.10c
Philadelphia	5.30c
Pittsburgh	4.80c
Portland	5.75c
San Francisco	5.65c
Seattle	5.75c
St. Louis	5.25c
St. Paul	5.15c
Tulsa	5.55c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.80c
Ft. Worth	4.40c
Los Angeles	4.05c
New York	3.99c
Philadelphia	3.75c to 3.90c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cleveland	3.65c
Detroit	4.30c
New York	4.49c
Philadelphia	4.00c to 4.25c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds and hexagons	Flats and squares
Boston	4.05c	4.55c
Buffalo	3.90c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.90c	4.40c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	——
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	——
San Francisco	4.25c*	——
Seattle	5.00c*	——
St. Paul	3.85c	——
Tulsa	4.66c	5.16c

*Rounds only.

COLD ROLLED STRIP

Boston, 0.100 inch, 500 lbs. lots	6.15c
Buffalo	6.25c
Chicago	5.85c
Cincinnati	7.15c
Cleveland, over 500 lbs. lots	5.95c
Detroit	6.20c
New York	6.25c
Philadelphia	5.50c
Pittsburgh	6.30c

FOREIGN IRON AND STEEL
New York duty paid

Swedish, hollow drill steel	15.00c
Swedish iron bars round	6.25c
Flats and squares	6.50c

WELDED PIPE
Discounts from warehouse, New York City Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—28	+21
¼ to ⅝-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—49	—23
2½ to 6-inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—12

WROUGHT IRON PIPE

	Black	Galvanized
¼ to ⅝-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	— 1	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 6
3 to 6-inch lap	— 3	+ 6
7 to 12-inch lap	— 8	+16

Coast Trading Quiet

Holiday Season Holds Back Activity—Small Lots Placed with Sellers Recently

SAN FRANCISCO, Dec. 24.—(*By Air Mail*)—Due to the holidays business in iron and steel on the Coast this week was almost at a standstill and little of importance has developed. The outlook for first half is bright and consumers and mill men alike anticipate a good volume of business.

Pig Iron and Coke

Pig iron and coke sales and inquiries have dropped to a low point and renewed activity is not looked for until after the first of the year. So far as can be ascertained no important sales or inquiries developed during the week. It is understood one importer has a large shipment of German foundry coke enroute to apply against contracts placed some time ago. Prices are unchanged.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah Foundry	25.00 to 26.00
*German	24.25
*Indian	25.00
*Dutch	22.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Small lots continue to dominate the concrete bar market. Awards during the week totaled 850 tons. A San Francisco jobber booked 500 tons for the Zellerbach Paper Co. warehouse in San Francisco and 100 tons for a warehouse in Sacramento for Libby, McNeil & Libby, Gunn, Carle & Co. booked 150 tons for the Sherman school, San Francisco, and E. J. Loyd an additional 100 tons for a wharf at Kalului, T. H. Pending business aggregates over 7000 tons. New inquiries include 100 tons each for crematories at San Mateo and Oakland, Calif., and 100 tons for the Blake, Moffit & Towne building at Sacramento, Calif. Local jobbers have withdrawn prices and new and higher levels will be announced after the first of the year. Demand for merchant bar steel has shown little improvement and sales continue to involve unimportant lots.

The Western Pipe & Steel Co. booked the only large plate award of the week, 250 tons of ¼-inch material for a pipe-line for the East Bay Water Co., Oakland, Calif. An additional 750 tons is yet to be placed. It is reported that the Yakima, Wash., pipe-line, which originally called for 300 tons of plates, will go cast iron and wood stave pipe. The Shell Oil Co. is again asking for bids on 1800 tons for nine 45,000-barrel tanks. The Standard Oil Co., San Francisco, is in the market for about 400 tons of material. Pending business totals over 11,000 tons. Prices are firm at 2.30c c.i.f. as a minimum.

Awards of structural steel during the week were confined, with two exceptions, to lots of less than 100 tons. The Wallace Bridge & Structural Steel Co., Seattle, booked 3100 tons for a highway bridge at Twin Falls, Idaho, and Judson Mfg. Co. took 100 tons for a building for the Associated Oil Co. at Emeryville. New inquiries include 250 tons for a building at Redwood City for the Pacific Portland Cement Co. and 450 tons for an apartment house in San Francisco. Pending business is in excess of 24,000 tons.

Fabricators are interested in the coming third annual steel conference at Del Monte in January and it is reported that both Charles F. Abbott and Lee H. Miller of the American Institute of Steel Construction will attend the meeting.

The price structure on the coast has been far from satisfactory during the past year and it is hoped that the ruinous cutting of prices will be eliminated during the coming year. Prices on plain material continues firm at 2.35c, c.i.f.

Other Finished Material

The only cast iron pipe award of importance this week was placed by the city of Glendale, Calif. The National Cast Iron Pipe Co. was awarded 671 tons and the American Cast Iron Co. took 408 tons. The cast iron pipe market has been exceptionally active for this time of year and over 5000 tons are being figured. New inquiries include 217 tons for Santa Barbara. Movement of standard tubular goods is considered fair though no unusual inquiries or sales are noted.

Activity in sheet and wire products markets has been slight during the past month but increased business is looked for as soon as inventory is completed.

Employment and Payrolls Lower in November

Washington, Dec. 28.—There was a general decline in employment in the iron and steel industries in November compared with October, according to the bureau of labor statistics.

Reports were received from 213 iron and steel mills which gave their October employment at 288,207 decreasing in November to 285,173. The payrolls in the plants decreased from $9,111,633 in October to $8,797,679 in November, or 3.4 per cent.

The bureau also received reports from 47 cast iron pipe factories which gave their October employment as 14,947 decreasing in November to 14,433, a drop of 3.4 per cent. The payrolls in the plants receded 2 per cent from $361,226 in October to $354,163 in November.

The bureau received reports from 152 structural ironwork plants giving their employment at 24,654 in October and 23,928 in November, a decrease of 2.9 per cent. Their payrolls totaled $719,070 in October and $685,024 in November, a decrease of 4.7 per cent.

Foundry and machine shop products plants numbering 989 reported October employment as 250,148 and November as 243,560, a decline of 2.6 per cent. Payrolls decreased from $7,516,932 in October to $7,225,212 in November, or 1.1 per cent.

One hundred and sixty machine tool plants reported their October employment at 31,969, increasing in November to 32,117, or 0.5 per cent.

Directs Commission to Probe Dividends

Washington, Dec. 28.—The senate has adopted, without discussion, a resolution introduced by Senator Norris, Nebraska, calling upon the federal trade commission to investigate and report back corporations paying stock dividends. While no mention was made at the time of passage the resolution was introduced following the recent announcement by the United States Steel Corp. of its 40 per cent stock dividend.

Issue Cornice Data

New specifications for improved sheet steel cornices have been issued by the Sheet Steel Trade Extension committee. They are published in filing folder form approved by the American Institute of Architects, and bear the file number A. I. A. 12L2. Copies may be obtained from the committee, Oliver building, Pittsburgh. Advantages in incombustibility, stability, light overhang weight, strength and safety and other features are pointed out in the folder.

Rail Publications Merge

Chicago, Dec. 28.—Effective with the issue of Jan. 8, *Railway Age* and *Railway Review*, two of the oldest railroad publications, will be merged under the name of the former.

Authorizes Improvements

New York, Dec. 28.—Recent reports of an appropriation of $5,000,000 to $7,000,000 by the United States Steel Corp. for expenditure at Lorain, O., are officially confirmed. The appropriation will be expended mainly in the development of the Hornsey-Wills process for producing pure, granular iron direct from ore. A portion of it will be spent for a new seamless tube and bar mill.

The Hornsey process of direct reduction differs from other similar processes in two directions. A series of rotary kilns are employed thus separating the different stages of the operation. One kiln is used for preheating, the second for reduction and the third for cooling the product. Each cylinder is driven by an individual motor. At the demonstration plant in England it has been found advisable to operate the second cylinder slightly faster than the first, and the third slightly faster than the second. A plant including kilns 5 feet diameter and 30 feet long will handle approximately 5 tons of ore an hour resulting in the production of about 2 tons of granular product an hour when using an ore with an iron content of 40 per cent.

Pulverized coal is used in the process which makes it possible to control the combustion and to maintain constant temperatures. The temperature does not exceed 1050 degrees Cent. in the process. The iron product is separated from the gangue by passing over magnetic separators of the drum type.

The product differs physically from that of the blast furnace in that it is in a granular form instead of being in the shape of pigs. It also differs chemically in that the iron reclaimed is essentially pure, resembling wrought iron, and is mixed mechanically with varying percentages of the other ingredients of the ore instead of being chemically combined with them. The carbon content, generally speaking, is lower than that of pig iron, but can be controlled at will within reasonable limits.

The Hornsey furnace produces a steel intermediate which may be used to make refined steel or wrought iron. This intermediate product can be handled in the open hearth, preferably starting with a small bath of molten pig iron, or melted in the electric furnace or in other ways.

The Manufacturers' Association of East Chicago and Indiana Harbor, Ind., has contributed $1,000,000 for the new 200-bed hospital to be built at Indiana Harbor. Construction will start at once. Total cost will be $1,200,000.

Germans Specialize in Adopting Mass Output

Washington, Dec. 28.—The introduction into Germany of mass production has resulted in a division of manufacture calling for specialization on the part of the individual machinery plants and the institution of common sales bureaus for the purpose of cost production. This end is usually obtained through the creation of a community of interest between two or more plants producing the same classes of machinery. Each plant limits itself to the manufacture of that class of products for which it is best suited and renounces production of other lines in favor of its former competitors. The unification of sales bureaus and sales practice has been another method widely used to reduce costs in Germany.

Industry to Make Study of Agriculture

New York, Dec. 28.—Industry and agriculture will be brought closer together by the business men's commission on agriculture, created jointly by the national industrial conference board and the chamber of commerce of the United States, whose personnel has just been announced by Charles Nagel, St. Louis, who is chairman. The membership includes E. M. Herr, chairman, Westinghouse Electric & Mfg. Co., and Alfred H. Swayne, vice president, General Motors Corp., both of New York. The commission will make a study of the agricultural problem and make recommendations in the effort to arrive at a well balanced, sound and sustained national agricultural policy."

Ore Leads Imports

Philadelphia, Dec. 28.—Manganese ore imports from British West Africa in the week ending Dec. 25 at Philadelphia aggregated 7226 tons. Chrome ore imports from British South Africa totaled 2900 tons and from Portuguese Africa 1046 tons. Iron ore imports included 533 tons from Germany and 197 tons from Spain. Pig iron received from the Netherlands totaled 350 tons. Alloy steel from Switzerland amounted to 49 tons. Germany sent 60 tons of wire rods and 25 tons of lapwelded tubes.

Sheet Warehouse Burns

Niles, O., Dec. 28.—Fire in the warehouse of the Thomas Steel Co. destroyed the structure, and heat and water damage to the stock of sheets stored therein caused a total loss of about $300,000. The warehouse adjoins the mill and operations have been suspended but will be resumed early in January.

Pig Iron Prices Lower

(*Concluded from Page* 1697)

tions early in January may be disappointed in their deliveries. Three Chicago melters have closed for about 1000 tons of foundry iron, and a similar tonnage of basic has been sold to a Wisconsin melter at $20, Chicago furnace. Several hundred tons of malleable also have been sold to a Wisconsin melter at $21, Chicago furnace.

Philadelphia, Dec. 28.—Eastern Pennsylanvia foundry iron shows some weakness. Twenty dollars, base, at the nearest furnace is the general level but apparently this has been shaded. Business is insufficient to thoroughly test the market. The principal selling involves pipe iron, one interest buying 4000 tons. A Delaware river pipe company has bought its second barge of iron from the new stack at Everett, Mass. Some makers are not quoting low phos due to their sold-up condition. The Chrome Steel Works and Standard Steel Works inquiries involving 600 tons have been not been closed.

St. Louis, Dec. 28.—The pig iron market is quiet. Sales reported during the past week totaled approximately 2000 tons, of which the St. Louis Coke & Iron Corp. booked 1500 tons. A leading manufacturer of car wheels is asking for prices on 3000 tons for several plants. Quotations are unchanged but the tone is easier.

Birmingham, Ala., Dec. 28.—Resumption of buying of pig iron is expected this week. A number of consumers lack supplies. Quotations remain firm at $20, base, Birmingham. Surplus stock at furnaces is light.

Warehouse Lull Continues

(*Concluded from Page* 1709)

operations on a larger scale. Prices hold firm on all products locally.

Iron and steel warehouses in the Chicago territory have been flooded during the past week with inquiries, but most of these have developed into price lists for inventory purposes. Actual steel purchasing has been light, and December will close below the November total. Recovery is expected about Jan. 15. Jobbers are taking stock and their inventories show little change from January, 1926.

Jobbers at Philadelphia have reduced cold rolled strip prices to 5.50c, delivered locally. Demand has been curtailed for holiday and inventory purposes. The minimum on merchant and concrete bars has been dropped $2 a ton.

Railroad Records Fall in 1926

Carriers Reach New High Levels in Practically All Departments—Achievements Claimed Possible by Large Capital Expenditures and Co-operation—Earnings Cross 5 Per Cent

WASHINGTON, Dec. 28.—In 1926 the railroads handled the greatest freight traffic ever offered them by shippers without congestion or car shortage except in negligible isolated instances, states the American Railway association. Substantial savings have accrued to shippers and the railroads have contributed largely to placing business on a stable basis and enabled industry to operate on smaller stocks than ever before, it is claimed.

This record volume of traffic has been handled expeditiously chiefly because of the large expenditures for capital improvements in recent years. Greater co-operation on the part of shippers, both individually and collectively, also has been a material aid, the association states. Fourteen regional boards, with a membership of 15,000, include representation from every industry.

The story of the railroads in 1926 from a statistical standpoint is told by the association as follows:

Since 1920 capital expenditures of the railroads have amounted to nearly $5,200,000,000, of which $875,000,000 was spent in 1926. In the latter year, however, expenditures authorized for capital improvements amounted to $1,325,000,000 of which authorizations approximating $450,000,000 will be carried over to 1927.

Capital expenditures in 1926 for equipment, which includes locomotives and cars, amounted to approximately $380,000,000, compared with $338,000,000 in 1925. Capital expenditures for roadway and structures, additional track, heavier rails, additional ballast, shops and engine houses, including machinery and tools, amounted to $495,000,000 compared with $410,000,000 the preceding year.

Car Loadings a Record

Little embellishment of the facts is necessary to make the performance of the railroads in 1926 one of the most interesting stories ever told. Loading of revenue freight for the year will amount to 53,260,000 cars. The total for the first 50 weeks was 51,586,000 cars, an increase of 2,033,000 cars or 4 per cent over the corresponding period last year, which had marked the previous record; it also was an increase of 4,600,000 cars, or 9.8 per cent, over the corresponding period in 1924.

Loading of revenue freight exceeded 1,000,000 cars in 27 weeks in 1926, the largest number of such weeks ever reported and an increase of seven over the number of such weeks in 1925. The greatest loading for any one week for all time was reported for the week ended on Oct. 30, for which the total was 1,216,432 cars. This exceeded by 91,994 cars the best previous record for any week prior to 1926 which was that for the week of Aug. 29, 1925.

Shipments in 1926 of miscellaneous freight, merchandise and less than carload lot freight were the greatest ever reported, while the movement of coal in the fall months exceeded all previous records.

Not only did the number of cars loaded with revenue freight in 1926 exceed all previous records but also the volume of freight traffic as measured in net ton miles, which is the number of tons of freight multiplied by the distance carried. Reports show that the volume of freight traffic for the first ten months in 1926 amounted to 405,131,386,000 net ton miles which exceeded by 19,107,698,000 net ton miles or 4.9 per cent the best previous record which was in 1923. On the basis of the showing for the first ten months, it is estimated that the total for the year will amount to 488,000,000,000 net ton miles, an increase of 32,000,000,000 or 7 per cent over the best previous year, also 1923.

The greatest freight traffic for any one month on record was carried by the railroads in October when it amounted to 48,273,089,000 net ton miles. This exceeded by 3,944,912,000 net ton miles or 8.9 per cent the previous high record made in September, 1926.

The railroads this year had fewer locomotives and freight cars in need of repair than at any time in recent years. Due to greater economy and efficiency in the use of fuel brought about not only through the use of improved locomotives but also educational campaigns among employes, the railroads in 1926 established a new low record in the amount of fuel used. For the first ten months, an average of 134 pounds of coal was required to haul 1000 tons of freight and equipment one mile.

The railroads in the first eleven months of 1926, installed in service 99,365 freight cars. Car ownership on Dec. 1, was approximately 124,095 cars or 5.4 per cent greater than on June 1, 1923, and the average carrying capacity per car owned increased 2.1 tons per car or 4.9 per cent.

There were also placed in service in the first eleven months of 1926, 2193 locomotives. The number of locomotives owned on Dec. 1 was a decrease of 2186 locomotives or 3.4 per cent compared with June 1, 1923, but the average tractive power increased 9 per cent. The railroads have at no time had less than 3800 serviceable locomotives stored in good repair.

Freight Movement Faster

Due to faster loading and unloading of freight cars as well as elimination of many delays in handling, freight shipments were moved with the greatest dispatch in 1926 that has ever been attained, the average movement per freight car per day in October having been 34.3 miles. This exceeded by 1.6 miles the previous record for any one month established in September, 1926. The average for the first ten months in 1926 was 30.4 miles, against 28.2 miles in 1925.

The average load per freight car, for the first ten months this year, was 27.2 tons. This was greater than in 1922, 1924 and 1925, but fell below 1921 and 1923.

A new high record in the average load of freight per train for any one month was established in October when it amounted to 829 tons. This was an increase of 33 tons over the best previous record in August, 1925.

The average number of miles each freight locomotive traveled per day was 60.6 miles, an increase of more than 12 per cent above the average for the previous five years.

Passenger traffic in the first nine months of 1926 showed a decrease of eight-tenths of 1 per cent under the corresponding period in 1925.

The railroads in 1926 were called upon to pay more taxes to local, state and federal governments than ever before, their tax bill for the first ten months this year having been $329,388,745, an increase of 39.9 per cent over 1921. It is estimated that the tax bill of the carriers for the entire year will be approximately $400,000,000, an average of more than $1,100,000 per day, and an increase for the year of $36,000,000 over the total tax bill for 1925.

Earnings Also Improve

NOT since the Transportation act became effective in 1920, *when the railroads were freed from government war control, has the return on property investment been so satisfactory as in* 1926. *The net operating income of Class I roads this year has been* $1,250,000,000, *the estimate being based upon a ten-month figure of* $1,035,475,630. *The rate of return on property investment in the five years ended with* 1926 *has been* 4.52 *per cent. The return by years since* 1920 *follows:*

1920	0.09	*per cent*
1921	2.92	*per cent*
1922	3.61	*per cent*
1923	4.48	*per cent*
1924	4.33	*per cent*
1925	4.80	*per cent*
1926	5.21	*per cent*

Exports Heaviest Since 1924

Shipments of 219,830 Tons in November Exceed All Monthly Totals Since January 1924—Tubular Products, Rails, Plates, Sheets and Bars Make Greatest Gains—Imports Vary but Slightly from October

IRON and steel exports in November, totaling 219,830 tons, were the heaviest since January 1924, when 249,126 tons was shipped, according to data just compiled and released by the iron and steel division of the department of commerce. The increased export tonnage was due largely to heavy shipments of steel bars, plates, galvanized and black sheets, tin plate, steel rails and tubular products.

Exports for the first 11 months of 1926 totaled 1,968,859 tons, compared with 1,620,363 for the same period of 1925, and 1,762,571 for all of last

IMPORTS AND EXPORTS

Gross Tons

	1926		1925	
	Imports	Exports	Imports	Exports
Jan.	79,067	174,585	77,105	141,777
Feb.	100,213	157,187	92,353	102,299
March	93,107	169,438	92,115	155,348
April	107,636	194,449	71,233	155,375
May	108,731	173,418	67,789	150,612
June	124,215	159,506	82,853	136,847
July	82,411	194,717	64,642	139,861
Aug.	91,578	171,588	68,489	188,465
Sept.	85,484	182,071	68,445	136,791
Oct.	81,830	172,070	80,045	141,817
Nov.	81,258	219,830	79,771	171,134
Dec.			98,400	142,209
Totals	1,035,531	1,968,859	943,240	1,762,571

EXPORTS BY COUNTRIES OF DESTINATION

Gross Tons

	November 1926	January through November 1926	January through November 1925
Austria		11	
Azores and Madeira Islands	33	110	3
Belgium	687	4,672	8,825
Bulgaria		318	116
Czechoslovakia			83
Denmark	378	2,596	1,287
Finland	130	2,124	1,212
France	343	8,934	8,140
Germany	76	1,044	2,382
Gibraltar	1	1	23
Greece	68	2,474	3,029
Hungary			3
Iceland			3
Irish Free State		807	52
Italy	9	22,747	41,505
Latvia		1	35
Lithuania		2	3
Malta, Gozo and Cyprus Islands	21	164	47
Netherlands	1,010	3,868	2,630
Norway	271	4,088	3,381
Poland and Danzig	43	66	124
Portugal	1,043	2,007	727
Rumania	76	2,421	1,299
Soviet Russia in Europe	7	2,870	1,528
Spain	302	2,279	5,786
Sweden	183	1,321	627
Switzerland	5	105	96
Turkey in Europe	262	3,013	1,788
United Kingdom	7,957	58,490	47,527
Yugoslavia and Albania	8	8	220
Canada	81,485	781,560	560,123
British Honduras	17	222	114
Costa Rica	196	2,440	2,763
Guatemala	598	9,859	6,673
Honduras	287	4,068	5,502
Nicaragua	148	6,599	4,808
Panama	1,314	8,060	13,926
Salvador	3,224	15,854	15,068
Mexico	7,282	94,164	95,695
Miquelon and St. Pierre Islands		5	6
Newfoundland and Labrador	75	919	1,563
Bermuda	59	286	212
Barbados	65	142	22
Jamaica	223	1,597	1,350
Trinidad and Tobago	953	5,766	5,021
Other British West Indies	219	1,504	2,191
Cuba	10,168	83,984	136,173
Dominican Republic	342	6,950	9,908
Dutch West Indies	537	5,895	3,521
French West Indies	3	14	13
Haiti	250	2,820	1,689
Virgin Islands of United States	25	351	254
Argentina	7,030	53,655	83,240
Boliva	75	772	1,672
Brazil	11,735	52,855	43,257
Chile	4,650	56,324	42,133
Colombia	10,879	60,709	72,333
Ecuador	98	1,399	2,008
Falkland Islands		2	
British Guiana	14	320	558
Dutch Guiana	113	783	588
French Guiana		46	
Paraguay	3	30	108
Peru	5,413	34,888	15,287
Uruguay	554	7,078	4,913
Venezuela	8,020	57,806	29,921
Aden			1
India	5,482	35,436	22,300
British Malaya	3,570	14,020	5,634
Ceylon	21	164	70
China	7,612	39,385	55,245
Java and Madura	954	12,468	8,202
Other Dutch East Indies	2,968	24,852	15,846
Hejaz, Arabia and Mesopotomia			
French Indo-China		18	2
Hongkong	174	1,879	3,494
Japan and Chosen	19,105	227,556	118,669
Iraz	9	2,254	
Kwangtung	125	20,003	1,765
Palestine and Syria	50	356	365
Persia	954	1,971	1,197
Philippine Islands	3,806	53,605	42,496
Siam	4	212	182
Soviet Russia in Asia		404	7
Turkey in Asia		502	497
Australia	4,090	27,064	20,406
British Oceania	2	89	68
French Oceania	13	95	119
New Zealand	69	2,865	1,821
Other Oceania			12
Belgium Congo	10	11	106
British East Africa	6	195	57
British South Africa	961	8,898	22,216
British West Africa	12	110	96
Egypt	473	5,588	3,183
Algeria and Tunis		2	20
Other French Africa		36	5
Italian Africa		6	
Liberia	3	54	53
Morocco	22	84	60
Portuguese East Africa	367	2,295	889
Other Portuguese Africa	1	112	141
Canary Islands		3	
Total	219,830	1,968,859	1,620,363

Exports of Metalworking Machinery

(In number except where otherwise designated

	November 1926	November 1925	January through November 1926	January through November 1925
Lathes		142		1,367
Boring and drilling machine tools		69		1,648
Planers, shapers, and slotters		21		286
Bending and power presses		35		361
Gear-cutting machines		21		386
Milling machines		96		936
Punching and shearing machines		9		195
Power hammers		19		206
Other metalworking machinery and parts, lbs.		1,097,702		13,186,954
Engine lathes	37		256	
Turret lathes	20		141	
Other lathes	40		575	
Vertical boring mills and chucking machines	3		70	
Thread-cutting and automatic screw machines	81	56	746	844
Knee and column type milling machines	27		194	
Other milling machines	11		343	
Disk type gear-cutting machines	1		12	
Other gear-cutting machines	13		184	
Vertical drilling machines	34		306	
Radial drilling machines	1		70	
Sensitive drilling machines	9		814	
Other drilling machines	24		1,061	
Metal-sawing and cutting-off machines	14		188	
Shapers and slotters	26		545	
Planers			14	
External cylindrical grinding machines	42	57	464	1,256
Internal grinding machines	34	34	223	299
Metalworking tool-sharpening machines	40		833	
Other metal-grinding machines (pounds)	51,661	104,725	650,884	1,290,507
Sheet metalworking machines (pounds)	301,531		5,996,476	
Plate metal-working machines (pounds)	10,854		413,372	
Rod or wireworking machines (pounds)	2,383		366,546	
Forging machinery (pounds)	271,476		5,604,257	
Rolling-mill machinery (pounds)	562,211		4,447,334	
Foundry and molding equipment (pounds)	675,403	445,999	6,101,876	3,544,866
Other power-driven metalworking machinery and parts (pounds)	786,038		7,394,434	
Hand or foot operated metalworking machinery and parts (pounds)	12,306		247,457	
Pneumatic portable tools	1,429	967	16,262	14,298
Other portable metalworking machinery (pounds)	48,959		290,854	
Chucks for machine tools	690	921	17,110	22,129
Reamers, cutters, drills, taps, dies and other metalworking tools (pounds)	345,291	172,869	2,553,355	3,167,007

year. Of the 1926 shipments, tubular products furnished 244,171 tons, tin plate 219,001 tons, galvanized sheets

(*Concluded on Page* 1722)

EXPORTS OF IRON AND STEEL PRODUCTS FROM THE UNITED STATES

Gross Tons

Item	Nov. 1926	Oct. 1926	Jan. through Nov. 1926	Jan. through Nov. 1925
Pig iron not including ferro-alloys	3,724	2,205	22,557	30,048
Ferromanganese and spiegeleisen	70	49	632	5,456
Scrap	6,234	7,872	96,936	78,868
Ingots, blooms, skelp, etc.	14,981	13,005	95,038	77,030
Iron bars	571	317	4,797	4,352
Steel bars	15,028	10,562	126,818	102,089
Alloy steel bars	463	414	4,605	3,124
Wire rods	2,547	978	16,851	19,369
Plates	16,301	10,550	129,452	94,517
Galvanized sheets	19,223	12,104	161,473	147,860
Black steel sheets	15,368	15,119	156,095	84,074
Black iron sheets	1,300	1,120	16,635	12,914
Hoops, bands and strip steel	4,372	3,521	43,703	36,878
Tinplate, terneplate, etc.	28,116	27,950	219,001	148,382
Structural shapes, plain material	15,482	10,922	146,504	94,699
Structural materials, fabricated	4,259	3,260	70,965	66,506
Metal lath	315	244	3,972	3,138
Steel rails	23,385	13,917	168,315	146,870
Rail fastenings, switches, frogs etc.	3,343	3,144	38,915	33,524
Boiler tubes and welded pipe	30,225	19,606	244,171	212,579
Malleable iron screwed pipe fittings	963	1,417	11,493	8,904
Cast iron screwed pipe fittings	560	569	8,634	6,058
Cast iron pressure pipe and fittings	1,266	1,459	12,097	14,152
Cast iron soil pipe and fittings	1,008	613	10,198	9,125
Plain wire	1,709	1,844	29,433	32,826
Barbed wire and woven wire fencing	2,956	2,999	49,127	65,243
Wire cloth and screening	188	112	1,813	1,754
Wire rope	490	293	4,446	4,054
Insulated wire and cable	18	18	608	616
Other wire and manufacturers of	791	845	8,235	7,555
Wire nails	704	1,253	11,115	8,893
Nails other than wire	430	86	6,584	8,377
Tacks	62	31	810	*
Horseshoes	56	97	627	621
Bolts, nuts, rivets, except track	929	924	12,295	15,477
Car wheels and axles	1,234	923	15,969	18,827
Iron castings	571	749	8,431	9,589
Steel castings	498	429	7,007	3,954
Forgings	90	150	2,500	2,061
Total	219,830	172,070	1,968,859	1,620,363

* Included with "other nails".

ORIGIN OF PIG IRON IMPORTS

Gross Tons

	November	October
Belgium	1,350	.....
France	1,116	.....
Germany	9,701	12,565
Netherlands	2,955	4,800
Sweden	25	130
United Kingdom	4	.....
Canada	530	398
British India	1,879	.....
Finland	.....	500
Totals	17,560	18,847

ORIGIN OF IRON ORE IMPORTS

Gross Tons

	November	October
Newfoundland	19,818	27,618
Germany	.....	553
Brazil	1,794	.....
Spain	.....	9,241
Cuba	22,000	38,500
Norway	.....	7,445

DESTINATIONS OF IRON AND STEEL EXPORTS

Gross Tons

Countries	Rails	Galvanized sheets	Plates not fabricated	Tin, terne plate	Steel sheets, black	Barbed wire	Steel bars	Steel scrap
Argentina	591	936	.....	3,049	674	171	.....	.....
Australia	.....	370	146	.....	800	73	553	.....
Brazil	7,337	627	35	1,254	.....	137	228	.....
British India	558	1,257	.....	3,154	.....	.....	.....	.....
British S. Africa	.....	62	.....	.....	.....	263	.....	.....
British Malaya	.....	900	.....	2,178	.....	.....	.....	.....
Canada	2,971	3,026	13,209	2,841	6,758	397	9,234	3,959
Central America	220	396	7	.....	12	85	200	.....
Chile	68	2,494	121	428	.....	.....	.....	.....
China	4,031	174	.....	1,155	.....	.....	66	451
Colombia	27	947	.....	737	.....	688	196	.....
Cuba	2,725	2,562	45	324	.....	117	222	.....
Dutch East Indies	.....	490	.....	.....	.....	.....	.....	.....
Dutch West Indies	177	.....	.....	1	.....	.....	.....	.....
Europe	.....	.....	49	.....	42	.....	8	.....
Other Europe	.....	517	.....	311	.....	.....	.....	.....
France	.....	319	.....	.....	.....	.....	.....	.....
Japan inc. Chosen	200	315	.....	5,931	5,890	.....	79	1,608
Java and Madura	.....	.....	.....	323	.....	.....	.....	.....
Mexico	814	624	366	912	150	321	176	44
Norway	.....	165	.....	.....	.....	.....	.....	.....
Peru	36	.....	49	899	34	.....	215	.....
Philippine Islands	.....	.....	.....	643	.....	73	216	.....
Salvador	2,272	.....	.....	.....	.....	.....	.....	.....
United Kingdom	.....	.....	.....	866	154	.....	3,063	39
Uruguay	.....	.....	.....	360	.....	.....	.....	.....
Venezuela	202	.....	.....	118	.....	.....	240	.....
Total	23,385	19,223	14,367	28,116	15,368	2,635	15,028	6,234

Chile	121,800	91,400
Virgin Islands	.....	2,000
Algeria and Tunis	19,883	12,900
Totals	185,835	190,228

ORIGIN OF FERROMANGANESE IMPORTS

Gross Tons

	November	October
France	.....	78
Sweden	35	37
Norway	2,656	790
United Kingdom	5	17
Canada	1,669	2,150
Totals	4,365	3,067

ORIGIN OF MANGANESE IMPORTS

Gross Tons

Concentrates

	November	October
Canada	60	.....
Brazil	15,089	7,365
Chile	200	.....
British India	2,170	3,640
British West Africa	2,572	2,326
Totals	20,091	13,331

ORIGIN OF IMPORTS

Gross Tons

	Cast iron pipe	Steel bars	Steel scrap	Ingots, blooms, etc.
Austria	.....	.....	.....	18
Belgium	3,162	4,443	.....	331
Canada	.....	6	5,646	.....
France	5,919	1,300	.....	189
Germany	.....	976	.....	.....
Czechoslovakia	282	.....	.....	.....
Netherlands	.....	350	.....	.....
Sweden	.....	540	26	.....
United Kingdom	15	87	1,989	11
Other Europe	.....	75	.....	90
	9,318	7,785	7,661	639

IMPORTS BY COUNTRIES OF ORIGIN

Gross Tons

From:	November 1926	January through November 1926
Austria	82	727
Belgium	24,227	212,712
Bulgaria	.....	5
Czechoslovakia	418	1,754
Denmark	.....	2,409
Finland	.....	799
France	9,849	121,540
Germany	21,802	249,725
Italy	67	902
Lithuania	.....	1,530
Netherlands	4,228	86,205
Norway	2,779	15,150
Poland and Danzig	77	1,877
Spain	.....	2
Sweden	1,099	25,530
Switzerland	31	50
United Kingdom	3,790	123,710
Canada	10,778	83,327
Honduras	143	144
Panama	.....	7,748
Mexico	.....	8,061
Newfoundland and Labrador	.....	1
Other BritishWest Indies	.....	403
Cuba	.....	9,357
Dominican Republic	6	68
French West Indies	.....	1
Virgin Islands of the United States	.....	3
Chile	.....	11
India	1,879	81,735
British Malaya	.....	5
China	3	10
Hongkong	.....	1
Japan including Chosen	1	21
Java and Madura	.....	1
Algeria and Tunis	.....	7
Total	81,259	1,035,531

IMPORTS OF IRON AND STEEL

Gross Tons

Product	Nov. 1926	Oct. 1926	Jan. through Nov. 1926	Jan. through Nov. 1925
Pig iron	17,560	18,847	430,819	388,092
Ferromanganese and alloys	4,365	3,067	36,273	67,909
Ferrosilicon	1,692	1,812	11,784	4,412
Scrap	7,661	13,347	80,489	89,397
Iron slabs	....	....	323	792
Steel ingots, blooms, billets, etc.	639	1,783	29,074	25,448
Steel bars	7,785	9,273	98,256	52,307
Iron bars	456	405	4,939	10,910
Wire rods	1,190	1,289	9,206	7,333
Hoops, bands, and scrolls	4,312	2,768	25,522	10,169
Boiler and other plate	259	270	4,151	794
Sheets, skelp and and saw plate	1,170	1,257	9,056	3,208
Tinplate	41	14	2,091	328
Structural shapes	15,348	10,892	110,645	73,495
Rails and splice bars	2,078	5,396	61,794	38,419
Cast iron pipe	9,378	6,553	71,779	43,769
Other pipe and tubes	5,029	2,128	25,763	21,790
Barbed wire	176	58	2,850	5,601
Round iron and steel wire	442	452	3,824	3,813
Steel telegraph and telephone wire	90	914	1,125	484
Flat wire and strip steel	411	319	3,938	1,986
Wire rope and strand	106	169	2,431	1,470
Wire cloth and screening	33	29	313	312
Other wire	47	1	1,478	574
Nails, tacks and staples	714	571	4,898	2,649
Bolts, nuts, rivets and washers	5	46	356	104
Castings and forgings	272	170	2,353	2,810
Horseshoes	....	....	1	86
Total	81,259	81,830	1,035,531	858,461

Germans Study Steel Practice

Design and Operation of Furnaces, Rolling of Seamless Tubes and Direct Steel Production Processes Are Principal Topics at Autumn Meeting of German Iron and Steel Institute—Attendance Is Large

VARIOUS topics of management and engineering in the iron and steel industry, particularly design and operation of metallurgical furnaces, were discussed at the autumn meeting of the German Iron and Steel institute held at Dusseldorf, Nov. 27-28, and attended by more than 2000 members and visitors. Rolling of tubes in the United States was the subject of two interesting contributions, while another described Swedish and Norwegian methods of direct steel production. The latter paper attached great interest because of the presence of the inventors of these processes, M. Wiberg of Sweden and E. Edwin of Norway. No verbal discussions were conducted at the meeting, decision having been reached that all remarks were to be submitted through correspondence.

The first paper, presented by P. Reinhardt, described the author's investigations in establishing a new heat diagram of the blast furnace. Diagrams of a number of blast furnaces in different countries, particularly in America, producing various classes of pig iron showed that the high excess of heat in the waste gases is existent only in the uppermost part of the furnace, whereas up to a temperature of approximately 900 degrees Cent. heat is practically completely utilized in the blast furnace. The heat expenditure necessary for the decomposition of the carbonate of lime has an essential influence on the consumption of coke, the excess of heat not being available for melting scrap iron even from with temperature in the waste gases.

Coke Consumption Varies

The diagram plotted also shows that a slight preheating of the blast results in a considerable economy of coke, but if the blast is preheated beyond certain limits the coke economy gradually decreases. According to the diagram the use of oxygen, or air enriched with oxygen, does not result in any economy in standard blast furnaces; neither is it possible to control the heat in the furnace by a variable addition of pure oxygen, but a simultaneous injection of coal dust and oxygen should have a good effect.

In his paper, "The Present Condition of our Knowledge on the Open-Hearth Furnace," E. Herzog, first explained the influence of heat radiation of the flame on the transmission of heat in the hearth of the furnace. According to recent experiments the bath is heated by the radiation of the flame, which proves the necessity of a sufficient content of soot in the flame. A mixture of waste and coke oven gases must be submitted to higher preheating than producer gas. The opinion, till now authoritative, that the decomposition of the heavy hydrocarbons and methane in the regenerators results in a corresponding decrease of the calorific value of the gas has been proved erroneous.

Produces High Grade Steel

According to research work of the open-hearth subcommittee of the German Iron and Steel institute, in addition to the efficiency of the regenerators as heat accumulators, the heat storage capacity of the interior walls of the flues connecting the chambers with the hearth, and in the more modern furnaces the interior wall surfaces of the slag pockets, also play an important part. The storage capacity of walls heated on one side only depends, however, on the magnitude of the losses through the wall. With thin walls these losses may be so high that no heat is transmitted to the air and the gas to be heated, it being lost in the surrounding atmosphere.

The Iron Research institute in Dusseldorf has made extensive investigations, similar to those performed in America, in connection with the high frequency furnace designed by Northrup. Dr. Korber, director of the institute, exposed these investigations in a paper, "The Metallurgy of the High-Frequency Furnace." According to research work conducted with three furnaces of from 40 to 50 kilograms each, thorough agitation of the bath is of utmost importance from the point of view of the metallurgical reactions which are to be accomplished in the furnace. The powerful refining effect of the furnace, due to the permanent renewal of the bath surface in contact with the refining slag, has made possible the production of mild stainless chromium steel from carbonous ferrochromium.

When correct action of the slag is obtained in the blast furnace the oxygen combined with the iron is within a short space almost completely carried into the slag. The steels produced with very low contents of carbon, 0.01 per cent, showed when cold rolled, peculiar softness and toughness. Even with the unfavorable conditions of a small laboratory furnace it is possible to produce high-grade steels in the high-frequency induction furnace. Experiments to date tend to show that the large induction furnaces required by large steelworks also should give equally good results. It is anticipated that the high-frequency furnace for the production of refined steels will gain the same importance as has been attained by other processes.

In a paper, "Oil Industry and the Manufacture of Seamless Tubes in the United States," F. Rosdeck mentioned the advantageous conditions which the United States enjoys on account of the narrow relations existing between oil production and the manufacture of tubes. For drilling purposes alone approximately 2,500,000 tons of tubes are required every year. The processes originated in Europe, but the manufacture of seamless tubes has been adapted to American conditions and correspondingly modified. Tubes up to approximately 225 millimeters diameter are made in the Mannesmann rolling mill with which is connected a reducing mill. Short tubes of from 225 to 500 millimeters diameter are made by the cupping process. Quite recently a combination of the Mannesmann and Pilger processes has been made use of. Production of American tube mills is considerably higher than that of German mills. The latter must be equipped on a more universal basis to adapt themselves to more varying requirements. On the other hand, threads cut on tubes in Germany by use of lathes are superior to American threads cut by dies.

Lauds American Tube Practice

In connection with this subject H. Koppenberg read a paper on "American Tube Rolling Mills," based upon investigations he made during a visit

to the United States. American tube mills are excellently equipped with mechanical auxiliary contrivances, operators are skilled and production figures are high. Until now seamless tubes have been manufactured almost exclusively by means of grooved rolls over a mandrel, but recently two complete tube rolling mills for the Pilger process, furnished by German works, started production.

"Comparative Time Studies in Rolling Mills, Especially in Wire Mills," was the subject of a paper by K. Rummel. Diagrams traced by a semi-automatic time recorder make it possible to follow all phases of the working of the mill. The diagrams afford an explanation as to why the different trains produce varying quantities, and enable the judging of the possibility of future improvements. The production figure depends more on the rhythm of work than on the actual time taken by one bar to pass. Such working analyses give sufficient information concerning correct distribution of the passes in the different trains and even above the economical value of the roll design. The ideas thus developed may also be applied to the design of rolling mills.

Reviews Direct Steel Processes

In a paper on "The Weatherproofness of Steels," K. Daeves opposed the opinion that steel is of no use in industrial regions with an atmosphere containing acids. A careful study of the numerous writings on the influence of copper in steel shows a considerably increased weatherproofness of steel containing approximately 0.2 to 0.25 per cent copper. In this connection, results of sheet corrosion tests made for many years by the American Society for Testing Materials are of great interest. However, the rust protection effect of the contents of copper exists only in steels exposed to the atmosphere, whereas there is no protection against corrosion under water. Copper in steel is of special importance to railway material, iron structures, agricultural implements, etc. Germany will be compelled by economical reasons to follow the example of America, which country in 1925 employed as much as 1,000,000 tons of cupriferous steel.

Upon the initiative of the German Iron and Steel institute, Prof. F. Wust examined two processes for the direct production of steel in Norway and Sweden together with the inventors. Based on his investigations, Prof. Wust gave a comprehensive survey of the possibilities of both processes and compared them with the process of the French inventor, M. Basset, which has been in an experimental stage for seven years, and, on the other hand, with the process developed by the bureau of mines, Washington, which latter distinguishes itself by extraordinary simplicity. The Edwin process is a gas circulating process which has made it possible to smelt Norwegian and Swedish ores otherwise not at all susceptible of utilization in the blast furnace on account of their unfavorable composition.

In the experimental plant at Trondhjem, Norway, phosphorus ores, until now almost useless, were converted into steel of superior quality. With the Wiborg process only a part of the gases circulates the excess of gas being burnt with air admitted in order to preheat the ore. The simple way of utilizing the excess of gas is a particular advantage of the Wiberg process. A judgment of the direct production process of Hornsey, performed in three revolving tubular furnaces arranged in series is not yet possible. As to the German ores, none of these processes is of any essential importance since they require crystalline ores which do not exist in Germany to any considerable extent.

In view of the importance of knowledge of the properties of the refractory materials for metallurgical furnaces, the subcommittee for refractory materials made known the results of the work now accomplished in a report entitled "Refractory Materials; Their Testing and Their Behavior in the Metallurgical Service," which was presented by E. H. Schulz. Until now standardization of refractory materials has encountered great difficulties. First of all it was necessary to standardize testing methods. Extensive research work still is required in order to arrive at simple and definite testing methods, which on the one hand, permit of clear relations between suppliers and customers and, on the other, prevent the use of improper materials. The establishment of quality standards will not be possible until these fundamental conditions have been settled.

Supply Associations to Meet Aboard Ship

The twenty-second annual meeting of the National Supply and Machinery Distributors' association will be held on board the steamship NORONIC, the boat leaving Detroit Monday, June 13, and returning there Friday, June 17. As in the past the Southern Supply and Machinery Dealers' association and American Supply and Machinery Manufacturers' association will join with the National association in holding conventions at the same time. Decision to hold the meeting at this time and in this way was reached at the midyear meeting of the executive committee and advisory board at the National association's offices in Philadelphia recently. The secretary-treasurer of the organization was instructed to compile and issue a directory giving the names, addresses and full data regarding the products handled by active and associate members of the association.

Steel Treaters Planning Winter Meeting

Plans are being completed for the winter sectional meeting of the American Society for Steel Treating which is to be held at Washington, Jan. 20-21, with the Washington and Baltimore chapters officiating as hosts. Headquarters will be at the Mayflower hotel. On Jan. 19, the day preceding the opening session, the newly elected national officers will hold their first business meeting, likewise the publication committee has arranged a meeting at the same time. In the evening an "Early Birds" dinner will be served and the party will attend the theater.

The opening technical session will be held on Thursday morning, Jan. 20, and the afternoon will be left open for an inspection trip. The day's program will close with a banquet. For Friday, two technical sessions have been scheduled, one in the morning and one in the evening, another inspection trip being planned for the afternoon.

The tentative schedule of papers is as follows: "Centrifugal Casting of Steel," by Leon Cammen; "Fundamental Research on Nonmetallic Inclusions in Steel," by C. H. Herty Jr.; "Progress in Study of Normal and Abnormal Steel," by Samuel Epstein and H. S. Rawdon; "Normality of Steel," by J. D. Gat; "Review of the Metallurgical Activities of the Washington-Baltimore District," by Emil Gathmann; "Wear Resistance of Cutting Edges of Blanking Die Parts and Shear Blades," by W. J. Merten; and "Brinell Balls," by G. W. Quick and C. P. Jordon.

Tax Refund Is Sought

Washington, Dec. 28.—Senator Smith, of South Carolina, has introduced a bill to refund $220,000 paid in excess taxes in 1917-1921, inclusive, to the Charleston Dry Dock & Machine Co. and Valk & Murdock Co. The bill was referred to the senate committee on claims.

Industrial Men in the Day's News

J. Fletcher Harper, New President of American Society for Steel Treating

SERVICE in the organization since its inception has been rewarded with his election to the presidency. He is associated with numerous other technical societies.

EDUCATED for the electrical engineering profession, he brought scientific research into the development of steel treating.

HIS contributions to the industrial and technical press have been many. He has delivered papers at various conventions on phases of treatment of steel.

ELECTION of J. Fletcher Harper to the presidency of the American Society for Steel Treating is deserved recognition of his long and loyal service to that organization. Although nominated at the convention in September, formal balloting has just been completed and the election announced. His activities in steel treating preceded the formation of that body. He served as a member of the board of directors of the American Steel Treaters' society in 1919-1920. With the organization of the American Society for Steel Treating in 1920, he was appointed chairman of the nominating and membership committees, holding the chairmanship of the latter committee in 1921-2. From 1923 to 1925 he served as a member of the board of directors, and during 1926 was vice president.

Mr. Harper has been active in committee work of the Steel Treating society, having served as chairman of the recommended practice committee since its foundation as such and having been a member of other bodies. The recommended practice committee issued the American Society for Steel Treating Handbook containing eight recommended practices and 369 pages of data sheets on 51 different subjects. He has contributed frequently to the technical press and has appeared before several societies to deliver scientific papers on various subjects.

Mr. Harper was born in St. Paul, and after elementary education in that city attended the University of Wisconsin, Madison, Wis., where he studied electrical engineering. After serving a special apprenticeship at the plants of the Allis-Chalmers Mfg. Co., Milwaukee, he experimented with farming in the state of Washington. Following his experience on the farm he was connected with the Northwestern Mfg. Co., Milwaukee, for about a year, leaving to return to the Allis-Chalmers company in charge of its heat treating departments. He was made assistant superintendent of the forge shop two years later and in April, 1921, was promoted to his present position of research engineer of the manufacturing department.

"Fletcher" as his friends call him is 6 feet 4 inches tall. Through his personality and character he has won a wide friendship which is evidenced in his selection as president of the Steel Treaters.

Other technical organizations to which Mr. Harper belongs are the American Foundrymen's association, Iron and Steel institute, London, and British Institute of Metals. He is a member of Psi Upsilon fraternity, Milwaukee Athletic club, Milwaukee University club, Che Ne Qua Country club and Westmoor Country club.

Although not an extremist in the pursuit of his hobbies, Mr. Harper is interested considerably in Turkish rugs and radio. He plays golf occasionally but is not an ardent devotee to the game.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

E. E. GOODWILLIE, Pacific Coast sales manager for the Bethlehem Steel Co. at San Francisco has been appointed assistant sales manager for the company and will make Bethlehem, Pa., his headquarters. Mr. Goodwillie, prior to his appointment as Pacific Coast sales manager in September, 1925, was district agent for the company at Chicago. He was appointed to the position formerly occupied by R. W. Gillispie, who recently resigned to become vice president of the Jeffrey Mfg. Co., Columbus, O.

Arnold E. Foster, assistant treasurer of the Bethlehem Steel Co. at San Francisco, has been appointed manager of sales on the Pacific Coast.

* * *

W. J. Stoop, general engineer of the Wheeling Steel Corp., Wheeling, W. Va., has been made general manager of the Morgan Engineering Co., Alliance, O.

* * *

George Herbert Jones, a director of Inland Steel Co., Chicago, has given $415,000 to the University of Chicago for equipping and endowing a chemical research laboratory.

* * *

F. A. Miller, formerly with the Chilton Class Journal Co., has been made vice president and director of sales and advertising, Gill Mfg. Co., Chicago, piston ring maker. His new appointment becomes effective Jan. 1.

* * *

Mahlon P. Leichtamer, former purchasing agent of the P. A. Achlin Co., Toledo, O., has been appointed representative in northwestern Ohio of the Betz-Pierce Co., Cleveland, iron and steel jobber. His headquarters will be at Toledo.

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Clinton S. Marshall, district manager for the American Steel & Wire Co. with headquarters at Worcester, Mass., has been named a life member of the board of trustees of the Worcester Polytechnical institute to represent the Massachusetts state board of education on that body.

* * *

Ambrose Swasey, president of Warner & Swasey Co., Cleveland, whose eightieth birthday celebration was reported in last week's issue, has endowed a chair of physics at Case School of Applied Science, that city, with $100,000.

* * *

N. C. Reed has been appointed district sales manager at the Detroit office, Wheeling Steel Corp., Wheeling, W. Va., succeeding James A. Henry, resigned. He formerly was district manager of sales at Boston. He has been with the Wheeling corporation since his graduation from Yale university in 1914, with the exception of service during the war. After the armistice he received a degree of metallurgy at the Sorbonne, University of Paris, before returning to resume his duties with the Wheeling corporation.

N. C. REED

W. M. Hall has been appointed district manager of sales at Boston to succeed Mr. Reed. Mr. Hall had been district manager of sales at Los Angeles.

Luther L. Jaynes has been made district manager of sales with office at Wheeling.

* * *

Maurice Nicholls, works manager, Irving Iron Works Co., Long Island City, N. Y., departed for England Dec. 27 to open a British branch of his company. Mr. Nicholls, who was graduated from Shadyside academy of Pittsburgh and University of Michigan, formerly was with the Diamond Power Specialty Co. He is a member of the American Society of Mechanical Engineers.

* * *

Fred J. Cooper is in charge of the office just opened at Pittsburgh by Union Mining Co., owner of Mount Savage Fire Brick Works. Prior to joining that organization he had been with Newton Steel Co. and American Sheet & Tin Plate Co.

* * *

George Collinge has been elected president of the Conneaut Shovel Co., Conneaut, O., to succeed W. H. Brown, resigned. Other officers elected were: Chester Welsh, general manager; J. T. Grant, vice president; Warren Miner, secretary and treasurer, and W. V. Miller, assistant treasurer.

* * *

Stewart Scrimshaw, since 1920 director of industrial relations of the Kearney & Trecker Corp., Milwaukee, manufacturing milling machines and other machine tools, has been awarded the degree of doctor of philosophy by the regents of the University of Wisconsin. Since 1922, he has been professor of industrial relations in the college of engineering, Marquette university, Milwaukee, and professor of economics in the Marquette graduate school, meanwhile serving the Kearney & Trecker organization.

* * *

William P. Ewing has been appointed assistant general manager of sales for the Superior Steel Corp., Pittsburgh. He has been with the company 10 years, a portion of which was spent in the mill office at Carnegie, but for the last five years he has been sales representative. Part of his duties as sales representative will be taken care of in the future by Walter G. Blume.

Reed L. Smith has been appointed assistant district sales manager with headquarters in New York. The metropolitan district will be covered in the future from the Philadelphia office in charge of John E. Wetzel,

(*Concluded on Page* 1722)

British Industry More Active

Holidays Curtailed To Facilitate Resumption of Iron and Steel Works—Greater Expansion Expected at Beginning of New Year—Germans Take South African Order for 50 Locomotives—Trade on Continent Quiet

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Dec. 28.—(*By Cable*)—Considerable activity is expected to develop in the British iron and steel industry at the beginning of the new year. Additional blast furnaces will be put in operation in a few days. Hematite is scarce, and other supplies are not plentiful. Small steelworks in Scotland are restarting, but the larger ones will not resume until after Jan. 1. Holidays have been curtailed to enable some works to get into operation. Transportation difficulties are a retarding influence.

British interests have lost an order for 50 locomotives for South Africa to German builders. The market for galvanized sheets is quiet and easier. Continental billets are being offered in the British market at £6 2s 6d ($29.70). The French and Belgian steel markets are inactive and prices are soft. German steel business is satisfactory, though export demand is quieter than for some time.

British Industry Slow Under High Fuel Prices

BIRMINGHAM, Eng., Dec. 16.—(*European Staff Service*)—The iron and steel trades appear to have made the best of their opportunities following the coal settlement. Furnaces have restarted in nearly all districts. Middlesbrough reports eight furnaces at work with the probability of 20 by this time next week. Ayrshire and Lanarkshire together have another eight in operation. Briton Ferry are starting four at their Albion works in South Wales, and several concerns controlling their own fuel supply have started furnaces. Lincolnshire will have several at work shortly, and by the end of the year there should be a respectable total in operation. It should be noted that the operating furnaces ar nearly all owned by big concerns using up the pig iron on the spot, and well equipped with batteries of coke ovens sufficient for their needs.

Sterling $4.85

This is a matter of great importance in view of the dogged maintenance of fuel prices by the coal owners. There is, in fact, hardly any inducement to make furnace coke as a business proposition, while coal and slack remain at their present prices. The few quotations for furnace coke reaching independent furnace owners are of such a character as to offer the strongest obstacle to the relighting of furnaces. Nothing can be done until coke comes down to prestrike figures, but it is noteworthy that one large firm having its furnaces out of action since the 1921 strike is making a restart. Everything depends on fuel, which still dominates the situation. Naturally, coal owners want to maintain present prices as long as possible, but admit the miners are making better production and though they have to pay 25 per cent more wages, in Cannock Chase for example, they should be well able to bring down the fuel to an economic basis. When they do so it is safe to say the iron and steel trade will produce on a scale unknown for some years past. Until they take this drastic step their most valuable customer must inevitably hold aloof, and in crippling the iron and steel trade the coal trade will injure itself.

Iron and steel buyers are not rush-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 27	*British* Gross Tons U. K. Ports	£ s d	*French* Metric Tons Channel Ports	£ s d	*Belgium and Luxemburg* Metric Tons Channel Ports	£ s d	*German* Metric Tons Rotterdam or North Sea Port	£ s d
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$23.16	4 15 6	$19.40	4 0 0	$19.40	4 0 0	$20.73	4 5 6
Basic	24.26	5 5 0	20.86	4 6 0	20.86	4 6 0	20.61	4 5 0
Basic-bessemer	23.04	4 15 0	18.19	3 15 0	18.19	3 15 0	18.19	3 15 0
Hematite, Phosphorus 0.02-0.05	22.43	4 12 6	29.30	740*	.....	.....	21.34	4 8 0
SEMIFINISHED STEEL								
Billets	$32.74	6 15 0	$24.74	5 2 0	$24.74	5 2 0	$25.46	5 5 0
Wire rods	43.65	9 0 0	29.71	6 2 6	29.71	6 2 6	29.10	6 0 0
FINISHED STEEL								
Standard rails	$37.58	7 15 0	$29.10	6 0 0	$29.10	6 0 0	$29.10	6 0 0
Merchant bars	1.73c	8 0 0	1.18c	5 9 0	1.18c	5 9 0	1.21c	5 10 0
Structural shapes	1.46c	6 15 0	1.18c	5 9 0	1.18c	5 9 0	1.21c	5 10 0
Plates, ship, bridge and tank	1.68c	7 15 0	1.39c	6 6 0	1.39c	6 6 0	1.54c	7 0 0
Sheets, black, 24 gage	2.38c	11 0 0	2.53c	11 10 0	2.53c	11 10 0	2.42c	11 0 0
Sheets, galvanized, 24 gage, corrugated	3.63c	16 15 0	4.68c	2,600*	5.07c	3,900*	3.74c	17 0 0
Bands and strips	2.38c	11 0 0	1.49c	6 15 0	1.49c	6 15 0	1.51c	6 17 0
Plain wire, base	2.11c	9 15 0	1.57c	7 2 6	1.57c	7 2 6	1.57c	7 2 6
Galvanized wire, base	2.76c	12 15 0	2.04c	9 5 0	2.04c	9 5 0	2.04c	9 5 0
Wire nails, base	2.06c	9 10 0	1.73c	7 17 6	1.73c	7 17 6	1.73c	7 17 6
Tin plate, base box 108 pounds	$ 5.34	1 2 0	.....	.....	.....	.....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			*French* Francs		*Belgian* Francs		*German* Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$26.68	5 10 0	$23.76	600(2)	$19.46	700	$19.55	85
Basic pig iron	25.46	5 5 0	22.36	590(1)	17.07	650	20.24	88
Furnace coke	8.49	1 15 0	8.16	206	7.51	270	4.95	21.50
Billets	32.74	6 15 0	30.29	765	22.24	800	25.88	112.50
Standard rails	1.73c	8 0 0	1.62c	900	1.30c	1,000	1.46c	140
Merchant bars	1.89c	8 15 0	1.51c	840	1.32c	1,015	1.40c	134
Shapes	1.68c	7 15 0	1.44c	800	1.32c	1,015	1.37c	131
Plates, ship, bridge and tank	1.89c	8 15 0	1.67c	930	1.50c	1,150	1.55c	149
Sheets, black, 24 gage	2.49c	11 10 0	2.97c	1,650	2.73c	2,100	2.29c	220
Sheets, galvanized 24 gage, corrugated	3.68c	17 0 0	4.95c	2,750	5.07c	3,900	3.65c	350
Plain wire	2.11c	9 15 0	2.97c	1,650	2.08c	1,600	2.03c	195
Bands and Strips	2.49c	11 10 0	1.89c	1,050	1.63c	1,250	1.62c	155

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 5s 0d ($6.06) f. o. b. Ferromanganese £16 0s 0d ($77.60) f. o. b. German ferromanganese £15 10s 0d ($75.18) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

ing into the market. It would be surprising if they did in mid-December, when buying is usually at an end for the year. A waiting policy is the rule. The trade has had enough of gambles, and is prepared to wait a little longer until prices are more stable. There is enough to encourage. Big work is pending as, for example, the building of a series of Thames bridges to cost £27,500,000. It is common knowledge that the railways have big orders to place when the price is right, and every day brings news of shipbuilding orders, electric undertakings, business extensions and enlargements, all of which will call for steel. A number of small orders are being placed, chiefly of an emergency character for steel, and occasionally a parcel of pig iron is bought. The Staveley Iron Co. has been remarkably conspicuous, as being the only furnace restarted in the Midlands, and on the Birmingham exchange this firm took an order for 50 tons of No. 3 Derbyshire foundry iron at £4 12s 6d ($22.42) for early delivery.

It is clear how the post-strike recovery will take place. Steel furnaces are getting back to work fairly rapidly, having plenty of scrap in stock and in many cases carefully hoarded accumulations of pig iron. Mills are restarting at a greater rate, in many cases taking advantage of foreign steel, but these are mostly plants producing bars, small sections, hoops, strip, stamping material and similar products. Big production is quite another story. A large Birmingham engineer this week requiring joists and sections received only one rolling list, the senders being the Cargo Fleet Co. of Middlesbrough quoting £8 5s ($40.01) net f.o.t. or £8 10s ($41.22) f.o.b. It is significant that every one of the half dozen sizes of joists and sections carried an extra. Prices are becoming slightly more definite. Angles are quoted at £7 17s 6d ($38.20), but are still subject to a premium of £1 10s ($7.27) per ton. It is obvious that a few more weeks will be necessary to clarify the situation with regard to prices.

Foreign prices are slightly easier, and it is clear that before English pig iron comes on the market good business will be done by importers of French iron, large quantities of which are being sold in the Birmingham and Midland area at £5 ($24.25) to £5 5s ($25.46).

Managers of iron and steel works frankly explain that they have taken the earliest opportunity of starting mills, solely in the interests of their workpeople, who after many months of idleness want to earn a little money for Christmas. Many wrought iron contracts now being executed were placed before the strike, and the price paid for fuel, although this has been substantially reduced, is still much higher than the figure on which the contracts were based. It is suggested that the coal will have to be reduced at least another 10s ($2.42) per ton before profitable production is possible.

Wrought iron prices have become rather easier, owing to keen competition with Lancashire and ordinary crown bars have been sold here at £12 12s 6d ($61.23) against the Lancashire price of £12 15s ($61.83). The tube trade is a good customer for skelp, the better supplies of fuel having brought this industry practically into full activity.

Belgian Mills Run on Backlogs

BRUSSELS, Dec. 15.—(*European Staff Service*)—The Belgian metallurgical industry already is beginning to feel the effects of the resumption of coal mining operations in England. Fortunately, most of the larger interests still are booked well ahead, since shipments exceed sales by a large margin. In view of the dullness of domestic and export markets buyers are holding out for price concessions.

The opinion prevails that the European steel entente will, if necessary, reduce tonnage quotas rather than cut prices. Belgian railways again have increased freight rates and this, with the high cost of combustibles and wages, will make it difficult to operate profitably on a much lower price basis than now prevails. Despite this fact several firms are making concessions on bars, but these instances are limited to concerns which made long-term contracts covering ocean freight when the rates were considerably lower than at present.

The question of rail freight rates presents a serious problem to exporters whose mills are at some distance from the seaport. The rate now being applied is equivalent to 4.9 times the prewar tariff, and rumors are circulating to the effect that another revision upward is being contemplated which will make the rate in gold equal to that prevailing in 1913. If these plans are carried out it will be necessary to increase the present tariff about 40 per cent.

Blast furnaces continue to operate at full capacity. Production is sold to Feb. 1 and foundries are finding it difficult to obtain even small tonnage. Prices are only nominal as no recent transactions have been recorded. The minimum price for export as fixed by the Franco-Belge-Luxemburg entente is £4 5s ($20.60) per metric ton f.o.b. Antwerp, but some business has been booked as high as £4 7s 6d ($21.20).

The semifinished steel department is beginning to show signs of weakness. Buying for English destinations has practically ceased. Domestic prices are for all purposes the equivalent of export prices which the mills continue to quote in sterling exchange. Prices remain unchanged; basic bessemer blooms 4 to 8 inches bring £4 17s ($23.50), billets 2½ to 4 inches £5 4s ($25.25) and sheet bars £5 7s ($25.95). Skelp prices are somewhat spotty and quotations range all the way from £5 5s to £5 7s 6d ($25.40 to $26.10) f.o.b. Antwerp.

Dullness prevails throughout the finished steel department. Merchant bars for export have been done as low as £5 10s ($26.65). Competition is keen on plates as French mills are naming £5 10s ($26.65), which is 2s ($0.48) under the Belgian price. Mixed rod specifications are being placed at from £5 16s to £5 17s ($28.10 to $28.35). Following the agreement just signed by Belgian, French and German manufacturers of machine steel wire prices are firmer and quotations average £6 2s 6d ($29.70), but orders are scarce at this figure.

German Production Tops Record Again

Berlin, Dec. 16.—(*European Staff Service*)—For the fourth month in succession Germany exceeded all previous records in the production of pig iron and steel and the output of finished products during October. Production of pig iron was 935,279 metric tons, compared with the previous high mark of 880,015 tons in September. The October output included 587,274 tons of basic bessemer pig iron, 196,552 tons of ferroalloys, 93,156 tons of foundry, 54,156 tons of hematite, 3856 tons of direct castings and 285 tons of gray forge. The number of furnaces in blast Oct. 31 was 97, against 90 Sept. 30; 62 furnaces were under repair and 26 were in working order.

Output of steel ingots and castings in October was 1,174,234 metric tons, compared with the preceding high mark of 1,144,182 tons in September. October output included 619,013 tons of basic open-hearth steel, 11,880 tons of acid open-hearth, 6083 tons of crucible and electric and 2566 tons of welding steel. The total October tonnage was composed of 1,156,428 tons of steel ingots and 17,806 tons of steel castings. Output of rolled products during October was 980,356 metric tons, against the previous high mark of 954,484 tons in September. The following table gives figures for the first ten months of this year, compared with the monthly averages of the three preceding years, in metric tons.

Mon.-Ave	Pig iron	Steel ingots and castings	Finished Steel
1923	411,360	525,435	.....
1924	651,020	819,605	681,195
1925	848,060	1,016,120	853,850
1926			
Jan.	689,463	790,971	669,788
Feb.	631,367	816,248	680,113
March	716,654	949,797	794,145
April	668,203	868,557	744,463
May	736,206	900,548	796,711
June	720,081	977,309	855,929
July	767,862	1,022,068	868,900
Aug.	850,208	1,141,316	907,510
Sept.	880,015	1,144,182	954,484
Oct.	935,279	1,174,234	980,356

Current Statistics of Industry

Steel Castings Bookings Drop in November

Washington, Dec. 28.—Bookings of steel castings in November, reported by principal manufacturers to the department of commerce, totaled 68,545 tons or 53 per cent of capacity. This was a drop from 72,399 tons and 56 per cent in October and from 83,197 tons and 66 per cent in November, 1925. Production in November totaled 84,685 tons, or 66 per cent of capacity, the increase over October being due to a gain in miscellaneous demand. Further comparisons of bookings and production follow:

BOOKINGS

	Total net tons	Per cent capacity	Railway specialties net tons	Miscellaneous net tons
1913	57,184	67	27,600	29,584
1914	43,602	51	21,142	22,460
1915	64,252	72	29,966	34,286
1916	101,015	107	54,645	46,370
1917	88,394	88	34,529	53,865
1918	109,374	105	48,124	61,450
1919	44,120	41	13,692	30,428
1920	78,597	68	33,080	45,517
1921	29,707	26	12,210	17,497
1922	77,167	67	38,890	38,277
1923	88,790	75	40,318	48,472
1924	77,764	64	39,961	37,803
1925	75,041	60	31,386	43,655
November	83,197	66	38,485	44,712
Total 11 mos.	800,115	58	325,979	474,136
December	100,377	80	50,654	49,723
Total	900,492	60	376,633	523,859
1926				
January	106,058	83	51,357	54,501
February	93,288	73	41,236	52,052
March	104,847	82	44,507	60,340
April	86,685	67	26,713	59,972
May	78,889	61	31,318	47,571
June	68,030	53	15,992	52,038
July	74,430	57	29,258	45,172
August	66,152	51	22,945	43,207
September	65,151	51	22,026	43,125
October	72,399	56	27,822	44,577
November	68,545	53	28,079	40,466
Total (11 mos.)	884,474	62	341,453	543,021

PRODUCTION

1926				
January	91,946	72	37,321	54,625
February	90,799	71	41,191	49,608
March	108,231	84	46,628	61,603
April	105,602	82	41,446	64,156
May	95,608	74	42,087	53,521
June	93,392	73	34,290	59,102
July	85,338	66	30,613	54,725
August	79,568	62	25,945	53,623
September	77,315	60	22,637	54,678
October	*77,537	60	25,587	51,950
November	84,685	66	24,362	60,323
Total (11 mos.)	990,021	70	372,107	617,914

*Revised.

Steel Barrel Business Recovers Strength

Washington, Dec. 28.—Shipments, production and unfilled orders in the steel barrel industry showed marked improvement in November, over October, according to reports from 31 manufacturers to the department of commerce. On the basis of 25 working days, 48 per cent of total monthly productive capacity was used to manufacture 510,489 pieces.

Steel Barrel Manufacturers' association, Cleveland, reporting the statistics of its members, lists shipments at 373,380, production at 31,950 and unfilled orders at 663,537. The volume of business received was valued at $1,231,777. Members operated 35.8 per cent of capacity on I. C. C. barrels and 49.6 per cent on light grades, making an average of 46.7 per cent of capacity.

Comparisons of department of commerce data follow:

	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
1925				
July	497,152	506,894	314,727	974,656
August	498,449	495,736	263,588	851,079
September	510,869	503,221	237,580	774,996
October	553,545	555,981	356,626	534,278
November	498,929	498,070	251,567	996,978
December	467,485	474,742	368,286	1,377,060
1926				
January	468,722	469,432	431,772	1,334,074
February	522,486	518,104	543,381	1,153,947
March	622,949	622,312	369,576	1,275,490
April	602,058	608,056	414,367	864,792
May	581,962	582,352	417,718	792,097
June	626,812	624,082	407,184	892,929
July	585,734	593,611	386,536	907,065
August	523,037	511,542	368,578	802,420
September	511,118	508,548	286,160	1,002,271
October	493,363	497,031	222,491	926,834
November	510,489	505,383	332,106	1,399,901

River Shipments of Steel Remain Steady

Pittsburgh, Dec. 28.—November shipments of iron and steel products on the Monongahela river, totaling 35,491 tons, were lower than October by 12,314 tons. On the Ohio river iron and steel shipments increased by 8722 tons. The total for the Monongahela river for the 11 months to date is the largest of any of the three preceding years by 87,670 tons. Comparative figures follow:

RIVER SHIPMENTS

	Allegheny river	Monongahela river	Ohio river
		In tons	
November	.....	35,491	38,566
October	30	47,805	29,844
September	451	40,540	26,840
August	150	40,370	32,704
July	.....	30,772	15,097
June	227	46,638	39,085
May	145	28,625	19,191
April	1,200	46,868	31,391
March	.....	34,666	25,675
February	250	23,577	20,228
January, 1926	30	16,535	16,700
December	610	20,506	37,423
November	530	25,800	49,041
October	15	22,200	25,260
September	3,560	31,430	22,987
August	.....	29,010	42,004
Totals, 1923	1,064	291,689	190,336
Totals, 1924	56,720	266,074	216,138
Totals, 1925	7,479	304,217	365,844
Total, 1926, 11 mos.	2,483	391,887	295,316

Steel Plate Bookings Heaviest Since 1923

Washington, Dec. 28.—Fabricated steel plate bookings in November totaled 50,863 tons, the heaviest since January, 1923, according to returns of 45 companies to the department of commerce. The principal increase was in tank cars, for which 17,784 tons was used in November, compared with 2052 tons in October. Comparisons that follow have been revised to include reports of 45 companies, whereas previous statistics were based on returns of 36.

	Total	Oil storage tanks	Gas holders	Blast furnaces	Stocks and miscellaneous
1923 total	559,799	303,416	44,576	9,815	149,033
1924 total	329,231	124,959	43,747	12,601	119,715
1925					
November	31,673	7,676	4,559	581	11,965
Total 11 mo.	271,820	72,335	28,890	11,670	111,323
December	33,700	7,884	3,172	407	16,297
Total (year)	367,114	99,134	36,621	12,651	154,186
1926					
January	27,484	8,316	2,286	1,720	11,132
February	37,541	10,184	4,068	806	15,227
March	39,764	12,693	5,048	377	15,163
April	36,345	6,390	5,261	1,857	19,837
May	49,971	16,243	4,190	1,742	22,312
June	41,695	11,114	8,282	1,123	17,627
July	34,213	12,827	1,716	989	15,539
August	48,140	21,725	1,240	1,728	15,133
September	35,489	17,038	871	861	10,773
October	41,314	23,070	744	994	11,672
November	50,863	19,111	1,821	363	9,643
Total (11 mo.)	442,819	158,711	35,527	12,560	164,058

Babbitt Sales Drop Again

Washington, Dec. 28.—Total apparent consumption of babbitt metal in November, based on reports from 27 companies to the department of commerce, was 4,358,127 pounds of which 3,211,227 pounds were sales by manufacturers and 1,146,900 pounds were producer consumption. Sales in November were the lightest in more than two years. Further comparisons of consumption and sales follow:

	Total apparent consumption	Sales by manufacturers	Consumption by producers
1925			
November	4,954,683	3,534,026	1,420,657
Total (11 mos.)	57,527,122	44,369,643	13,157,479
December	4,878,806	3,910,160	968,646
Totals	62,405,928	48,279,803	14,126,125
1926			
January	5,152,694	3,708,383	1,444,311
February	5,139,952	3,867,710	1,272,242
March	5,860,453	4,852,805	1,007,728
April	5,229,199	3,817,253	1,411,946
May	4,797,038	3,640,369	1,156,669
June	4,963,975	3,633,211	1,330,284
July	5,015,464	3,676,664	1,338,800
August	4,986,825	3,632,920	1,353,905
September	5,337,032	3,854,702	1,482,330
October	4,868,053	3,529,081	1,338,972
November	4,358,127	3,211,227	1,146,900
Total (11 mos.)	55,708,902	41,424,805	14,284,097

Men of Industry

(*Concluded from Page* 1718)

and Mr. Smith will operate under the direction of that office.

* * *

Prof. Thomas Turner's retirement from the chair of metallurgy in the University of Birmingham, England, was marked on Dec. 3 by a presentation of gifts from numerous past and present students, colleagues and friends. He received a framed photograph of himself which will hang permanently in the metallurgical department of the University of Birmingham. In addition a bound volume containing the names of the subscribers and an expression of appreciation of his services to metallurgy and a motor car were presented. Among other distinctions Professor Turner has been awarded the Bessemer gold medal of the Iron and Steel institute. By his original researches he has enriched the science of metallurgy and has exerted an influence upon the development of metallurgical technique which place him in the forefront of the great metallurgists of his generation to whose genius the unprecedented advances of the last few decades are due.

* * *

George L. Barton has been appointed district sales representative for Louisiana and Arkansas for the Equitable Meter & Mfg. Co., with his headquarters at Shreveport, La.

* * *

George Dix, president of Sheet Piling, Inc., New York, sailed Dec. 26 for a business trip to Germany. Sheet Piling, Inc., sells sheet piling in the United States manufactured by a German interest.

* * *

W. M. Bastable, who joined the Electric Welder Controller Co., Pittsburgh, as recently announced, has taken a position as New York sales manager. He formerly was with the Wilson Welder & Metals Co., Hoboken, N. J.

* * *

W. S. Koithan and R. W. Pryor Jr., for many years joint managers of the New York office of the Buffalo Forge Co., and Buffalo Steam Pump Co., Buffalo, have been placed in charge of the Philadelphia office of those companies. They will continue to manage the New York district.

* * *

Edward N. Hurley, chairman, Hurley Machine Co., Chicago; W. C. Warden, chairman, Pittsburgh Coal Co., Pittsburgh; John Harris, Harris, Winthrop & Co., New York, and Elmer T. Stevens, vice president of Charles A. Stevens & Bro., Chicago, have been elected to the board of directors of the Studebaker Corp., South Bend, Ind., to fill vacancies.

* * *

Charles F. Colbert Jr., Pittsburgh, vice president and general manager of the Consolidated Coke Co. and affiliated interests for the past five years, has been elected president of the following companies: Consolidated Coke Co., Pioneer Coal & Coke Co., Tidewater Coal Co., Superior Connellsville Coal Co., United States Fuel Co., Colbert Supply Co., and the National Transportation Co. He continues as vice president and general manager of the Sewickley Supply Co. He recently purchased stock and holdings of the last remaining partner in these various operations, namely George Whyel, who has been head of the properties for the past 20 years.

Exports Highest Since January 1924

(*Concluded from Page* 1714)

161,473 tons and black sheets 156,095 tons.

Imports in November aggregated 81,259 tons, a slight drop from 81,830 tons in October, and approximately the monthly average for the year. Receipts in the first 11 months of 1926 totaled 1,035,531 tons, compared with 858,461 tons for the same period of last year, and 943,240 tons for all of 1925. Total imports for 1926 will be the heaviest since 1903 when 1,178,797 tons were received.

The feature of the November import list was the unusually heavy tonnage of structural shapes received, 15,348 tons being the total, compared with 10,892 tons in October. Pig iron continued the most prominent product in imports, taking 17,560 tons in November, and 430,819 tons for the first 11 months of the year. Structural shapes totaled 110,645 tons for the first 11 months of 1926.

Germany and Belgium continued the largest exporters of iron and steel to the United States, the former supplying 21,802 tons and the latter 24,227 tons in November. Of the 1,035,531 tons imported by the United States in the first 11 months of 1926, 249,725 tons came from Germany and 212,712 tons from Belgium. France supplied 121,540 tons and United Kingdom 123,710 tons.

A Christmas bonus of $50,000 to $60,000 was distributed among 2300 employes of the Commonwealth Steel Co., St. Louis.

Obituaries

HARRY P. OTIS, former president of the Norwood Engineering Co., Florence, Mass., manufacturer of hydrants, filters, etc., and treasurer and general manager of the Northampton Emery Wheel Co., Northampton, Mass., died Dec. 26 at his home in Florence, Mass., aged 73 years. He was born in Manchester, Conn., and was graduated from the engineering department of the Massachusetts Agricultural college in 1875. As treasurer and general manager of the Emery Wheel company, he succeeded his father, Gen. John Lloyd Otis.

* * *

Edward L. Reinhard, of the American Radiator Co., Buffalo, died Dec. 20, at his home in that city, aged 47. He was born in Columbus, O. Oct. 7, 1879, and joined the American Radiator Co. about 15 years ago.

* * *

Frank M. Bookwalter, veteran banker and turbine water wheel manufacturer, died Dec. 23 at his winter home in Bay Haven, Fla., aged 79 years. He became connected with James Leffel & Co., Springfield, O., between 1870-5 and was vice president and treasurer until his retirement some years ago.

* * *

Drew E. Booker, superintendent of the Youngstown Sheet & Tube Co. plant at South Chicago, Ill., died recently at his home there.

* * *

R. A. Browne, secretary and treasurer of the Riverside Iron Co., Chicago, died recently at his home in that city, at the age of 29 years.

* * *

James King Hoyt, senior partner of A. Milne & Co., New York, dealers in iron and steel, died recently at his home at the age of 65 years.

* * *

Isaac G. Ladd, associated with Charles M. Schwab at the time of the formation of the United States Steel Corp., died Dec. 23, at Norwood, Mass. He was graduated from Brown university, Providence, R. I., in 1880.

Machinery

Year Closes as One of Best for Machine Tool Industry—December Closes With Sales Far Below Average

THE year closes with activity in the machine tool and equipment market at a low point. Although numerous inquiries are current, buyers are marking time until after Jan. 1. Requirements are being postponed in order to place purchases on next year's books. According to present indications, buying will not get under way actively until the latter part of January. As a whole 1926 has been a most satisfactory year; for some interests sales exceeded those for 1925, while for others they were a close second. Westinghouse Electric & Mfg. Co. has issued its list for first quarter requirement and with some 80 standard tools involved is one of the largest lists of the year. Other sizable lists are expected shortly. Crane buying has been dull in December.

New York, Dec. 28.—Buying by Norfolk & Western against its list of some 38 or 40 machine tools, features an otherwise rather spotty machine tool market. Included in recent orders are a car wheel lathe and a 90-inch locomotive journal turning lathe, both orders going to the Niles-Bement-Pond Co. Norfolk & Western, as previously noted, has placed two other machines with this builder and has awarded contracts to one or two others. It appears likely that all purchases will be completed before the first of the year. New York Central has closed on a floor grinder and Chateaugav Ore & Iron Co., Standish, N. Y., on two upright drills and one 5-foot radial drill; and Parker-Wheeler Electric Co., Ampere, N. J., on a 26x60-inch engine lathe. all going to the Niles company. Other orders booked by this concern include a 4-foot radial drill for the Potomac Electric Co., Hagerstown, Md. and a keyseater for Sullivan Machinery Co., Chicago.

New York Rapid Transit Co., New York, has closed on a 13-inch geared-head lathe; General Electric Co., Schenectady, N. Y., on a universal bench miller; Jones & Lamson Machine Co., Springfield, Vt., on a thread miller and Monongahela Railway Co., Pittsburgh, on a 16-inch geared-head lathe, all going to the Pratt & Whitney Co. This builder also has closed on four 16-inch geared head lathes for a concern in Kohler, Wis.; a profiler for a Philipsburg, N. J., company; a jig borer for a motor car manufacturer in Detroit; a hand miller for another concern in that city; and a thread miller for a company in Elkhart, Ind. American Brown Boveri Corp., Camden, N. J., has awarded a large order for gears to the Niles-Bement-Pond Co.

Boston, Dec. 28.—Boston & Maine railroad bought several tools during the past week against a list which has been out for some time. Other than this, sales were few and mostly for individual tools. Several large manufacturers are known to be preparing fairly long lists for purchase after the first of the year. Used tool dealers report exceptionallv quiet conditions. Tool manufacturers within the district are getting toward the end of their order books. Operations, however, continue close to 60 per cent and confidence in new orders for January is universal.

Pittsburgh, Dec. 28.—Pending tool business was augmented last week by the first quarter list of Westinghouse Electric & Mfg. Co. This is by far the largest list put out this year, involving 80 or more standard items, including two turret lathes, milling machines, drill presses, lathes, etc. Norfolk & Western railroad bought motor-driven wood planer, the latter item going to Somers, Fitler & Todd. Additional purchases are planned for early next year. Action on Pennsylvania railroad's requirements for Altoona, Pa., likewise is deferred until early 1927. American Sheet & Tin Plate Co., the Jones & Laughlin Steel Corp., and other large interests here will probably place orders against their lists next month. It is understood that the first mentioned has awarded the mill equipment for Gary, Ind., to the United Engineering & Foundry Co., and the Mackintosh-Hemphill Co.; the gear drives going to the Mesta Machine Co. Auxiliary equipment still is to be bought. United Engineering & Foundry Co., also received contracts for tube mill equipment for the Bethlehem Steel Corp.'s Sparrow's Point plant. It has ordered automatic pipe threading machines from a local seller. Jones & Laughlin Steel Corp. inquiry for 15 cranes for its seamless tube mill here has been revised, 20-ton capacity cranes being substituted for the 35-ton. Other sizes down to 5-ton capacity are mentioned. This interest is figuring on pipe threading machinery, coupling manufacturing equipment, etc. December as a whole has been the most quiet month of the year for a number of crane sellers. Westinghouse Electric & Mfg. Co. is in the market for cranes, including one which will be welded instead of riveted.

CRANE ORDERS PLACED

Two 10-ton electric overhead cranes for Safety Cable Co., Bayonne, N. J., definitely awarded to Shaw Crane Works.

Two cranes for Aluminum Co. of America to be shipped to Tallahasee Power Co.; one 100-ton to High Rock, N. C., to Niles Crane Corp., and one 75-ton for Alcoa, N. C., to Northern Engineering Works.

Among single orders were 4-ton handpower crane for city of Mechanicsville, N. Y., to New Jersey Foundry & Machine Co., 10-ton handpower crane for Essex county hall of record, Newark, N. J., to Cleveland Crane & Engineering Co.; 500-foot tramrail system equipped with 2-ton electric carrier for Armstrong Cork Co., New Brunswick, N. J., to Cleveland Crane & Engineering Co.; 10-ton crawler crane for Seguine & Bogert, Dover, N. J., to Orton Crane & Shovel Co.; ½-yard shovel for Midland Contracting Co., Roselle Park, N. J., to Orton Crane & Shovel Co.; 12-ton rail crane for Engineering Supply Co., Jersey City, N. J., to Orton Crane & Shovel Co.; 12-ton crawler crane for Oakdale Contracting Co., New York, to Orton Crane & Shovel Co.

CRANE ORDERS PENDING

15 cranes, 5 to 20-ton, for Jones & Laughlin Steel Corp.'s seamless tube mill, Pittsburgh; inquiry revised last week, 20-ton cranes being substituted for the 35-ton units.

Two 6-ton truck cranes for street-cleaning department, borough of Richmond, New York; bids in; the city is to supply the trucks.

25-ton locomotive crane for borough of Queens, New York; Orton Crane & Shovel Co., low bidder with Browning Crane Co. second.

Special locomotive crane for Carnegie Steel Co., Houston, Tex., warehouse; inquiry revived, revised propositions being considered.

Chicago, Dec. 28.—During the past week machine tool buyers have been rather unwilling to purchase, and few orders were placed. In general, December will not equal November, a good month. It is expected, however, that recovery in purchases will have set in by about Jan. 15. Orders placed this month mostly were for tools pending for some little time. The number of inquiries now is fair, although no new lists of consequence have appeared. One inquiry arousing some interest is from the Universal Portland Cement Co., Buffington. Ind., for two 24-inch lathes and one horizontal boring machine. One or two of the automotive buyers are reported to be feeling out the market preparatory to first quarter purchases, but railroad interest is dead. Prices are stronger, announcement of several increases being made for Jan. 1. Pratt & Whitney Co. on that date will advance lathe prices about 10 per cent and several other builders will follow suit on shapers and millers. Used tool buying is in good shape the main interest reporting a total business for 1926 about equal to 1925.

Cleveland, Dec. 28.—Except for single tools here and there, sales in this district have continued the slump of recent weeks. Apathy against buying is more noticeable, although dealers anticipate renewed interest after the middle of January. Used tools move somewhat better than new but still business placed is below normal. The automobile industry in Detroit is practically out of the market and there is little hope for improvement for several weeks to come.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

BAYONNE Bolt Corp. has been organized under the laws of New Jersey and has purchased outright the properties, plant and equipment of the Bayonne Bolt & Nut Works, formerly operated as a divisional unit of the Hoopes & Townsend Corp., and later by the receivers of the latter corporation. This plant was also known as the Bayonne division of the American Bolt Corp., prior to the organization of the Hoopes & Townsend Corp. Originally it was owned by the Bayonne Bolt & Nut Co.

The new corporation began operation as of Dec. 21, free and clear of any business or fiscal ties with any other plant or company. J. Rich Steers, who was president of the Bayonne Bolt & Nut Co., from 1914 to 1923, has been elected chairman of the board. E. L. Ruff, who was vice president and plant manager during the same period, is president and treasurer of the new corporation. Arthur D. Morris, associated with the business during its various phases sin ce1912 and in charge of its sales since 1912 and in charge of its sales ager of sales. W. H. Ackerman is secretary, and James H. Berry assistant treasurer.

The New York offices of the corporation are located at 17 Battery Place and the plant is at Bayonne, N. J.

* * *

H. L. BROWN FENCE & MFG. CO., Cincinnati, is operating its plant at capacity to meet demand. An evidence of large business is the receipt of orders last week for 125 miles of ornamental lawn fence and flower guards.

* * *

ONE of the largest export shipments of heavy machinery being made from Milwaukee this year is an order for 47 powerful ore crushers to Chile for the Symons Bros. Co., copper smelters, by the Nordberg Mfg. Co., Milwaukee. Each of the crushers is 10 feet in diameter, 12 feet high and weighs about 50,000 pounds. They represent the latest development in heavy disk crushers and will be used for pulverizing ore for the smelters. Drive is by electric motors. Delivery is being made by rail to New York and by boat to the South American port. Part of the order has just been loaded and sent east, the remainder to go forward early in January.

* * *

AMTORG TRADING CORP., New York, has received advices from Baku that preparations are under way for the erection of a large oxygen, acetylene and welding plant, on the American plan, in the soviet oil city, by the International Oxygen Co., Newark, New Jersey. I. G. Polonsky, representing the Soviet metal syndicate, is now in Baku making arrangements for construction of the plant.

* * *

WILLIAM CRAMP & SON SHIP & ENGINE BUILDING CO., which is controlled by the American Ship & Commerce Corp., is to segregate the properties operated by its I. P. Morris Co. department. This non-marine department will be organized into the I. P. Morris Corp. and controlled by a holding company. It is also proposed to transfer to this holding company stocks owned by the De La Vergne Machine Co., Pelton Water Wheel Co., and Federal Steel Foundry Co. Stockholders willl meet Dec. 29 to act on the proposals. The I. P. Morris properties are used for the construction of hydroelectric machinery and are said to be the most profitable unit in the Cramp group.

* * *

COLUMBIAN STEEL TANK CO., Kansas City, Mo., is engaged in a rebuilding program to replace all its units by new buildings. It was planned to do this without interruping work but after the first unit was completed it was found the added space was needed to keep up with production demands and it was impossible to demolish the building on the ground where the second unit will be built. Accordingly the fabricating department there housed is being moved to the roof of the first unit. This space is being covered by a canopy of tubular members welded instead of riveted and surprising strength is being developed. Fabricating will be carried on there, releasing the ground area for the second unit.

Safety Trophy Presented to J. & L. Workers

Pittsburgh, Dec. 28. — Work in November was accomplished without a single fatality at the Aliquippa and Pittsburgh works of the Jones & Laughlin Steel Corp. This was announced to 1000 employes of the corporation at a meeting in Memorial hall where a bronze trophy emblematic of the championship was presented to the Pittsburgh plants.

Such a record in steel plants employing close to 20,000 men was highly commendable and probably surpasses any since the safety campaigns were begun in 1906, said Earl F. Blank, safety director of the corporation, in reviewing the records of the month. The test this year was based on severity of accidents and time loss per man per 1000 hours.

T. M. Girdler, vice president and general manager of the corporation, spoke briefly, urging the men to continue the good work and to present any ideas they may have on safety. Fred E. Fieger, general superintendent, Aliquippa, extolled the Pittsburgh record. G. H. McClain, safety engineer, Pittsburgh works, presented the bronze trophy to J. S. Riggs, general superintendent of the Soho works, to keep for the Pittsburgh plants. Another speaker was Walter C. Titus, safety engineer, Aliquippa works. C. M. White, superintendent of the railroads which carry the corporation products, presented to J. R. Geddes, superintendent of the Monongahela railroad, a small shield emblematic of highest safety record among the carriers.

Class one railroads on Nov. 30 had 144,921 surplus freight cars in good repair and immediately available for service, the American Railway association reports. This was an increase of 29,187 cars compared with Nov. 23. Surplus coal cars Nov. 30 totaled 12,521, an increase of 3799 cars within approximately a week while surplus box cars totaled 98,794, an increase of 21,079 cars for the same period.

Would Educate Cities on Specifications

Washington, Dec. 28.—Secretary of Commerce Hoover believes, it is understood, that there is a good chance for the steel industry to educate municipalities on steel specifications as regards materials which can be furnished by American mills and those which frequently are furnished by foreign steel makers.

Mr. Hoover pointed out recently that the European steel cartel by putting up the prices of steel immediately helped rather than hurt the steel mills of this country. Steel imports into the United States are for the most part, he said, on specialized materials. Also, there is considerable difference between the specifications of American and foreign mills which is not always understood the purchasing agents of the various municipalities.

World Watches America

Chicago, Dec. 28.—At the annual banquet of the Illinois Manufacturers' association, held recently at the Congress hotel, Paul F. Beich, president, Paul F. Beich Co., Chicago and Bloomington, Ill., was elected president for 1927, succeeding Charles Piez, chairman of the Link-Belt Co., Chicago. Other executive named were, as follows: J. D. Cunningham, first vice president; J. L. Donnelly, second vice president; and Peter S. Theurer, president, Shoenhofen Co., Chicago, treasurer.

Guest of honor at the meeting was Sir Henry Worth Thornton, president, Canadian National railways, who declared that to a large degree the welfare of many other nations rests in the hands of the United States. However, he warned, "great wealth and power expose the recipient to the dangers of pride, vainglory, arrogance and ruthlessness." Col. William Nelson Pelouze, chairman, Illinois commission of the Great-Lakes-St. Lawrence Tidewater association, declared that once this contemplated seaway route has been completed, the Middle West will become the commercial center of the world.

Ford Motor Co. is said to be introducing the five-day work week at its Manchester, Eng., branch plant and to be adjusting wages to insure "willing workers" no reduction in total wages.

German Zinc Output Low

Washington, Dec. 28.—German zinc production in 1925 declined more than 400 per cent compared with production in 1913, according to a report to the department of commerce from Assistant Trade Commissioner William T. Daugherty, Berlin. The estimated production last year was about 50,000 tons while the figure for 1913 was 281,000 tons. World production of zinc in 1925 is estimated at 1,128,000 tons, against 1,001,000 tons in the the last prewar year. Current production of zinc by Germany, therefore, is about 4.4 cent of world production.

Consumption of zinc in Germany has fallen from 235,000 tons in 1913 to some 180,000 tons in 1925. While Germany was self-contained in this respect before the war and even exported some of the metal, the situation is now reversed. The reason is chiefly, of course the Polish Partition of 1922 which deprived Germany of about 75 per cent of its former Upper Silesian zinc ore and all of its smelters. Plans to erect a smelter on the German side of the border are still under consideration with prospect of materializing shortly.

Industrial Business Changes

SUPERIOR STEEL CORP., Carnegie, Pa., with general offices in the Union Trust building, Pittsburgh, has appointed Brace-Mueller-Huntley Inc., with offices in the Marine Trust building, Buffalo, and the Keith Theater building, Syracuse, N. Y., sales representatives for its hot and cold rolled strip steel for New York state, excluding the metropolitan district of New York City, and also in the following counties in Pennsylvania: Erie, Crawford, Venango, Warren, Susquehanna, McKean, Potter, Tioga, Bradford, and Wayne.

* * *

Brehm Grinding Co., 2095 East Ninth street, Cleveland, has leased larger quarters at 3115 Croton avenue and will move its production there.

* * *

Judson Mfg. Co., San Francisco, has been appointed representative in that territory for the junior beam manufactured by the Jones & Laughlin Steel Co., Pittsburgh.

* * *

Torrington Mfg. Co., Torrington, Conn., has taken over the machinery division of the Blake & Johnson Co., Waterbury, Conn., and will continue its operation.

* * *

Wetmore Reamer Co., Milwaukee, will be represented after Jan. 1 in Michigan territory by Rummins & Murray Inc., 4829 Woodward avenue, Detroit.

* * *

Southern Car Wheel Co., Pittsburgh, has bought the plant of the New York Car Wheel Co., Buffalo, at Hammond, Ind. The plant adjoins the works of the buyer at Hammond.

* * *

Durand Steel Locker Co., Chicago, manufacturer of lockers, racks and shelving, will open an office in Boston Jan. 1. It will be located at 201 Devonshire street and will be in charge of M. R. Bonaventure.

* * *

Worcester Machinery Co., Worcester, Mass., manufacturer of small machine tools, has been taken over by Harris Grace, head of the Grace Machinery Co., Worcester, and will be operated under the name of Grace Machinery Co.

* * *

Union Mining Co., Allegheny county, Maryland, owner of the Mt. Savage Fire Brick Works, established in 1841, has opened a sales office in the Davis Theater building, Pittsburgh, in charge of Fred J. Cooper as district representative.

* * *

Costello Engineering Co. has made exclusive selling arrangements in Great Britain on its patented pair furnaces with the International Construction Co., 56 Kingsway, London, England, in charge of S. L. Bengtson, managing director.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

Where additional information is presented, reference is made to date of issue in which previous item appeared.

SHEFFIELD, ALA.—Sorg Engine Co., Ossoso, Mich., is planning a plant for the Muscle Shoals district.

SHEFFIELD, ALA.—Bliss Refrigerating Machine Co., 2815 Book Tower building, Detroit, manufacturer of refrigerating machines is considering plans for a plant in the Muscle Shoals district.

EMERYVILLE, CALIF.—Associated Oil Co., Associated Oil building, San Francisco, is building shops for manufacture of auto truck bodies and steel tanks here.

SAN JOSE, CALIF.—American Can Co., Mills building, San Francisco, will build three 1-story factory and shop buildings at Fifth and Martha streets, here.

TORRANCE, CALIF.—Columbia Steel Corp., 215 Market street, San Francisco, will build extensions to its plant including six sheet mills and additional open-hearth furnaces.

BRIDGEPORT, CONN.—Bridgeport Bed Spring Co. has let contract to E. F. Construction Co., Wells street, for a 1-story addition.

NEW BRITAIN, CONN.—Hart & Cooley Mfg. Co. has been incorporated with $1,000,000 capital to manufacture steel and other metals.

SOUTH NORFOLK, CONN.—Beacon Oil Co., Beacham street, Everett, Mass., is building a 1 and 2-story warehouse and repair shop here.

WALLINGFORD, CONN.—W. A. Ives Mfg. Co., manufacturer of carpenter tools, has leased larger quarters and will expand its operations and make up for loss of production in a recent fire.

CHICAGO—Ketler Elliott Co., C. S. Miller manager, 3121 South California avenue, will build a machine shop and office building two stores 50 x 120 feet. Obrenstein & Hil, 222 East Ontraio street, is architect.

CHICAGO—U. S. Talking Film Co., Raymond Robins president, care William A. Morrow, architect, 6 North Michigan avenue, is having bids submitted for a 1-story plant 26 x 50 feet at Fifty-fourth and Kolin avenue.

CHICAGO—Commonwealth Edison Co., 72 West Adams street, J. B. Casey engineer, same address, is taking bids on a top addition to its machine shop and transformer plant, 22 x 134 feet and 22 x 150 feet, one story, at Roscoe and California avenues.

CHICAGO—Skylights Inc., 58 East Washington street, has been incorporated with $20,000 capital to manufacture skylights for buildings and accessories, pulleys and appliances by Robert B. Newell, Irving G. Brown and Sam B. Harding. Charles H. Wells, First National Bank building, is correspondent.

CHICAGO—Olson-Kehl Co., 546 West Washington street, has been incorporated with $40,000 capital to manufacture water heaters, plumbing and heating supplies by Henry J. Viemann, Milton Baldock and Henry P. Etheridge. Henry Perlman, 140 North Dearborn street, room 1304, is correspondent.

CHICAGO—Superior Specialty & Mfg. Co., 628 West Jackson boulevard, has been incorporated with $20,000 capital to manufacelectrical and mechanical specialties by Joseph Freud, A. A. Worsley and Edward J. Carlson. Worsley & Worsley, 179 West Washington street, suite 1010, are correspondents.

GALESBURG, ILL.—Winslow Boiler & Engineering Co., Chaberlain and Knoxville streets, is considering erection of a 1-story plant 50 x 150 feet.

QUINCY, ILL.—Gardner Governor Co., H. Malone purchasing agent, has let general contract to Buerkin & Buerkin, Broadway and Second street, for an addition to its machine shops, 1-story 53 x 130 feet. Behrensmeyer & Hafner are architects.

BUTLER, IND.—Tital Electric Co. has been incorporated with $18,000 capital to manufacture electric motors and steel specialties by W. F. Roberts, A. M. Sicard, J. O. Oberlin, L. C. Harding and H. C. Springer.

ELKHART IND.—Marshall Electric Co., 3225 Locust street, St. Louis, has let contract to Sumner Sollitt Co., 307 North Michigan avenue, Chicago, for a 1-story plant 50 x 100 feet. Bert C. Hubbard, 53 West Jackson boulevard, Chicago, is architect.

FORT WAYNE, IND.—Wayne Tank & Pump Co., W. M. Griffin president, Canal street and Nickel Plate road, is building a 1-story plant 140 x 300 feet.

HAMMOND, IND.—W. C. Hutchison, Oakley avenue and Sibley street, is taking bids for a 1-story machine shop and garage 85 x 150 feet.

INDIANAPOLIS—Peoria & Eastern railroad will rebuild roundhouse machine shop and replace damaged equipment resulting from fire.

MICHIGAN CITY, IND.—Royal Metal Co.,

Where Machinery Exports Went in October

	Lathes			Drills					Pneumatic						
	Engine	Turret	Other	Vertical	Radial	Sensitive	Other	Gear cutters	portable tools	Planers	Shapers and slotters	Metal sawing cutting	Milling knee column	Machines other
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	2	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	3
Czechoslovakia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
France	2	.....	2	1	.....	.....	1	.....	241	.....	3	.....	3	.....
Germany	2	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	1
Italy	.....	.....	.....	.....	.....	.....	3	.....	19	.....	.....	.....	.....	.....
Netherlands	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Spain	.....	.....	.....	.....	.....	.....	.....	.....	130	.....	.....	.....	1	.....
Sweden	1	.....	.....	1	.....	.....	.....	1	1	.....	.....	.....	.....	.....
United Kingdom	3	3	3	1	3	1	16	14	110	.....	4	1	2	4
Canada	2	5	11	3	6	1	.....	.....	149	.....	4	2	1	1
Mexico	1	.....	1	3	.....	.....	.....	.....	35	.....	1	.....	.....	.....
Cuba	.....	.....	2	.....	.....	.....	.....	.....	2	.....	.....	1	.....	.....
Argentina	.....	1	.....	.....	.....	.....	.....	.....	15	.....	.....	.....	.....	.....
Colombia	.....	1	.....	.....	.....	.....	.....	.....	4	.....	.....	1	.....	.....
Chile	.....	.....	1	.....	.....	.....	.....	.....	24	.....	.....	.....	.....	.....
Brazil	.....	.....	.....	.....	.....	.....	.....	.....	12	.....	3	1	.....	.....
British India	.....	.....	1	.....	.....	2	.....	.....	64	.....	.....	.....	.....	.....
China	.....	.....	.....	.....	.....	.....	.....	.....	14	.....	.....	.....	.....	.....
Japan	.....	.....	.....	5	1	.....	1	.....	352	.....	.....	.....	.....	27
Philippine Islands	1	.....	2	.....	.....	.....	1	.....	21	.....	.....	.....	.....	.....
Australia	7	1	.....	.....	.....	.....	.....	.....	95	.....	2	.....	2	2
New Zealand	.....	.....	.....	.....	.....	.....	.....	.....	7	.....	3	.....	.....	.....
British S. Africa	.....	.....	.....	.....	.....	.....	.....	.....	30	.....	1	.....	.....	.....
Other countries	1	.....	6	1	5	1	4	.....	64	.....	1	.....	2	.....
Total October	34	11	29	15	15	5	31	15	1,391	.....	22	6	11	38
September	18	9	48	32	6	43	128	40	1,351	3	149	13	17	13
August	20	23	37	16	3	80	91	18	1,056	.....	55	21	12	22
July	12	11	71	17	2	28	62	19	1,269	2	16	23	35	25
June	14	10	59	24	1	105	85	6	.....	3	20	19	30	18
May	14	17	41	44	8	281	81	12	.....	.....	23	22	11	22
April	25	11	41	28	7	84	314	16	.....	111	33	19	104	75
March	6	9	75	46	5	122	92	22	.....	.....	34	16	14	43

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.50
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	10.00 to 11.00
North African low phosphorus	9.25 to 9.75
Swedish and Norwegian low phosphorus, 68 per cent	10.25 to 10.75
Swedish foundry or basic, 66 to 68 per cent	9.00 to 9.50
Spanish foundry or basic, 50 to 54 per cent	8.75 to 9.25
North African foundry and basic 50 to 54 per cent	8.50 to 9.50

(All foreign ore prices now nominal)

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum, 47 per cent	36 cents
Indian, minimum 47 per cent	36 to 38 cents
Caucasian, 53 to 55 per cent	
Washed	38 to 40 cents

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, imported duty paid eastern tidewater, per ton	16.75 to 17.50

Chicago, manufacturer of metal furniture and wares, has bought site here and will build plant of 50,000 square feet floor space.

TERRE HAUTE, IND.—Phil Easterday Co. will build plant for manufacture of ma- Chamber of commerce is in charge of project.

MASON CITY, IOWA.—Ulen Radiator Repair Works will build a 2-story 88x99-foot garage and shop building to cost $60,000.

OSKALOOSA, IOWA—Chicago, Rockland & Pacific railroad will build a 1-story 20x45-foot engine house.

MANHATTAN, KANS.—Kansas State Agricultural College, care state architect, Charles D. Cuthbert, state capitol, Topeka, Kans., will build a power plant and install equipment. State board of administration, T. J. O'Neill business manager, Topeka, is in charge.

SHREVEPORT, LA.—Missouri Pacific railroad announces plans for a new freight warehouse costing $20,000. E. A. Hadley, St. Louis, chief engineer, is in charge of plans.

BOSTON—Dahlquist Mfg. Co., 36 West Third street, South Boston, manufacturer of copper products, will build a 2-story addition. Warren Engineering Corp., 50 Terminal Wharf, Charlestown, Mass., is engineer.

CANTON, MASS.—Norfolk Japanneries Inc., Neponsit avenue, is building a plant. John P. DeWolf, 45 Broomfield street, Boston, is engineer.

BUCHANAN, MICH.—Ward Electric Refrigerator Co., H. B. Hutchings secretary and treasurer, 1221 Beaufait street, will build a factory building.

DETROIT—Dodge Bros., Inc., Joseph Campau avenue, is building a 1-story machine shop 200 x 1632 feet on Lynch road.

DETROIT—Best Metal Co. has been incorporated with 30 shares no par value to manufacture metals and deal in ores by Emil B. Horne, 2698 Fullerton avenue, Clifford H. Broad, Redford, Mich. and E. Elmer Staub, Grosse Points Park, Mich.

DETROIT—Dri-Steam Valve Corp. of Michigan has been incorporated with $10,000 capital to manufacture steam valves by Horace J. Caulkins, 482 Rivard boulevard, Minnie Peck Caulkins and Henry U. Caulkins, Grosse Pointe, Mich.

KALAMAZOO, MICH.—Kalamazoo Stove Co., A. L. Blakeslee general manager, has let contract to R. D. Boyer for a 1-story addition for use as an enameling plant.

WYANDOTTE, MICH.—Regent Stove Co. is having plans made for a 1-story addition for an enameling plant, and improvements to other structures.

MARSHALL, MINN.—Bladholm Bros., proprietors of the Marshall Machine Shop, will build a 44x130-foot reinforced concrete machine shop.

MINNEAPOLIS—Brown Sheet Iron & Steel Co., steel tank and barrel manufacturer, is building an adidtion 75x75 feet.

MINNEAPOLIS—Northern States Power Co. will build a 12-story office building at Hennepin avenue and Fifth street.

MINNEAPOLIS—Northwestern Collapsible Carrier Co., 2920 Talmadge avenue SE, will build a 2-story factory building. An architect has not been selected.

MINNEAPOLIS—Strong-Scott Mfg. Co., 413 South Third street, manufacturer of flour mill machinery, will build a 2-story addition 100x 500 feet. Larson & McLaren, Baker building, are architects.

MINNEAPOLIS—Bids are being received by F. S. Gram, city purchasing agent, for 400 tons of sewer castings to be used in sewer construction during 1927. N. W. Elsburg is the city engineer.

MINNEAPOLIS—Chicago, Milwaukee, St. Paul & Pacific railroad will build a steel and concrete bridge over the Mississippi river between Minneapolis and St. Paul near the new Ford plant, to cost $1,500,000.

ROCHESTER, MINN.—Olmsted County Power Co. Inc., has been incorporated with a capital of $50,000 by A. E. Lamprecht, O. V. Hanson and A. H. Clemens.

ST. PAUL—Bids will be taken in January on a municipal barge terminal at the Pig's Eye site on the Mississippi river, including a large dock with crane, freight house, tracks and complete loading equipment, to cost $400,000.

WINONA, MINN.—Work has been started on a 50x197 and 56x97-foot L-shaped brick and concrete factory building at Fifth and Vila streets for the Diamond Huller Co.

GULFPORT, MISS.—C. F. Lytle Construction Co., 504 Nebraska street, Sioux City, Iowa, has been awarded the contract for building a sea wall 9½ miles long to cost $1,314,000.

KANSAS CITY, MO.—Johns-Manville Co. plans erection of large plant, costing approximately $500,000, for manufacturing absestos products, early in 1927. Definite plans not yet announced.

KANSAS CITY, MO.—Essenmueller Mill Supply Co., B. H. Essenmueller secretary, 1220 South Eighth street, is having plans drawn for a 1-story roller grinding plant 50 x 130 feet at Thirteenth and Kansas avenues.

KANSAS CITY, MO.—F. & Oliver Carlot, 205 Reliance building, has let contract to J. E. Dunn, 502 Reliance building, for a 1-story electric shop 50 x 121 feet. Eugene Snyder, 507 Reliance building, is architect.

EAST HELENA, MONT.—American Smelting & Refining Co. will build an addition to smelter and install new blast furnace at a cost of $100,000. B. N. Rickard is the general manager.

GLENDIVE, MONT.—Northern Pacific railroad, St. Paul, Minn., will begin work next spring on a 63-mile railroad extension from Glendive to Brockway to cost $3,000,000.

LAUREL, MONT.—Northern Pacific railroad, St. Paul, Minn., contemplates building a 100x250-foot shop building to be used for building steel cars and will cost with equipment $300,000.

MISSOULA, MONT.—Chicago, Milwaukee, St. Paul & Pacific railroad, formerly the Chicago, Milwaukee & St. Paul, will relay about 35 miles of track between Ravenna and Drummond.

ALLIANCE, NEBR.—Newberry Hardware Co. will build a 50x150-foot shop building to be used for sheet metal work and tank construction.

KEARNEY, NEBR.—Central Power Co., 2219 Central avenue, Kearney, will build an electric line between Kearney and Gibbon to cost $40,000.

LOUISVILLE, NEBR.—Work will soon be started by the Ash Grove Cement Co., Kansas City, Mo., on a cement plant with complete modern equipment.

BAYONNE, N. J.—Safety Cable Co., Bergen Point, manufacturer of insulated cables, has let contract to Walter Kidde & Co. Inc., 90 West street, New York, for three additions, each one story.

BAYONNE, N. J.—Bayonne Bolt Corp. has been incorporated with $100,000 capital and 5000 shares no par value to manufacture bolts and nuts by Ernest L. Ropf, West New Brighton, N. Y.; Arthur D. Morris, New York; James H. Berry, White Plains, N. Y. Register & Transfer Co., Jersey City, N. J., attorney.

BRIDGETON, N. J.—Engels Tractor Co. has been incorporated with $10,000 capital and 2000 shares no par value to manufacture tractors by Edward M. Lamar, John A. Casarown and Douglas V. Aitken.

CLIFTON, N. J.—Clifton Waste Paper Co., 73 East Clifton avenue, has let contract to

William Hassan, 625 Main avenue, Passaic, N. J., for a 1-story machine shop 48 x 376 feet. Karl A. Lefren, 171 Madison avenue, New York, is engineer.

DANSVILLE, N. Y.—Power Specialty Co., Charles H. Reigart superintendent, is considering plans for an addition to be devoted to manufacture of coal pulverizers.

FORT WASHINGTON, N. Y.—Maritime Accessories Corp. has been incorporated with 100 shares no par value by W. J. Eldredge, C. P. Schroetter and J. R. Stewart. Foley & Martin, 64 Wall street, are attorneys.

NEW YORK—George Murad has been invorporated with $20,000 capital to manufacture metal castings by G. Murad, D. Waldman and R. Golin. H. Bloom, 38 Park Row, is attorney.

NEW YORK—Curman Co. has been incorporated with $10,000 capital to manufacture motors and engines by W. G. Curman and J. H. Hickey. T. F. Hyland, 43 Exchange place, New York, is attorney.

WHITE PLAINS, N. Y.—Hargrave & Schiebel has been incorporated with 100 shares no par value to manufacture motors and engines by R. N. Hargrave, H. J. Schiebel and T. Hartmeann, J. B. J. Gerely, White Plains, N. Y., is attorney.

MINOT, N. DAK.—Minot Gas Co. Inc. has been incorporated with a capital of $500,000 by Samuel J. LaDue and Elmer J. Williams, Minneapolis.

ROCKINGHAM, N. C.—Novelty Mfg. Co. has been incorporated with $30,000 capital to manufacture metal and other novelties by W. A. Williams, J. B. O'Brien and Claude Gore.

MANDAN, N. DAK.—Northern Pacific railroad, St. Paul, Minn., will build a 48x80 brick and reinforced concrete power plant to cost $100,000.

WILLISTON, N. DAK.—Montana-Dakota Power Co. will build about 150 miles of transmission lines between McGregor and Grenora, Plentywood and Scobey, Outlook and Whitetail. C. C. Yawkey is president.

AKRON, O.—Portage Tool Co., C. H. Hall secretary and treasurer, 414 South Broadway, will build a 1-story plant 50x150 feet on Wingate avenue.

AKRON, O.—Akron Equipment Co., M. R. Coin manager, Exchange and Annandale streets, will build a 2-story plant 63 x 65 feet. General contract let to Harry Kinson, 277 North Arlington street.

AKRON, O.—Akron Mirror & Glass Co., L. C. Huguelet, 184 East South street, has let contract to Harry Kinson, 277 North Arlington street, for a 1-story plant 50 x 100 feet. George L. Ball, Metropolitan building, is architect.

CLEVELAND—Bryant Heater & Mfg. Co., 17825 St. Clair avenue, will build a 1-story addition 100 x 280 feet to its plant to enlarge production. Fox, Duthie & Foose, 6523 Euclid avenue, are architects.

CLEVELAND—Standard Car Wheel Co., 6704 Bessemer avenue, recently bought by the Griffin Wheel Co., Chicago, was damaged by fire and one building will be rebuilt, others repaired.

CLEVELAND—Gogan Machine & Foundry Co., J. Gogan president, 1630 Collamer avenue, is buliding a new plant at 1440 East Fifty-fifth street, to give larger production. It manufactures shaft heat-treating machines and spring forming and quenching machines, pump-driven bulldozers and bending machines.

CLEVELAND—Goldsmith Metal Lath Co., Max S. Goldsmith president, Third street and Eggleston avenue, has let contract to Max Penker & Sons Co., 123 Valencia avenue, for a 1-story plant at Orient and Chickering avenues. Gustave W. Drach, 1701 Union Trust building, is architect.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$40.00 to 43.00
Pennsylvania, No. 2	35.00 to 38.00
Ohio, No. 1	40.00 to 43.00
Ohio, No. 2	35.00 to 40.00
Illinois, No. 1	40.00 to 43.00
Illinois, No. 2	35.00 to 38.00
Kentucky, No. 1	40.00 to 43.00
Kentucky, No. 2	38.00 to 40.00
Missouri, No. 1	40.00 to 43.00
Missouri, No. 2	35.00 to 38.00
Maryland, No. 1	40.00 to 45.00
Maryland, No. 2	36.00 to 40.00
Georgia and Ala. No. 1	40.00 to 45.00
Georgia and Ala. No. 2	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Chicago	52.00
Birmingham	52.00

MAGNESITE BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	65.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	45.00

OKLAHOMA CITY, OKLA.—Holmboe Co., 422 West Second street, has had plans drawn for a 1-story shop 70x100 feet for the repair of construction machinery.

OKLAHOMA CITY, OKLA.—J. B. Klein Iron & Foundry Co. has contract for structural steel and miscellaneous iron for addition to University Hospital, Enid, Okla., costing $50,000 and comprising three stories and basement.

SEMINOLE, OKLA.—Brauer Machine Co., capital $10,000, incorporated by Walter Brauer, Herman Brauer and A. M. Campbell t ooperate machine shop for oil field repair work.

TULSA, OKLA.—Frisco railroad is surveying for site for new shops and yards to be moved from Sapulpa, Okla. F. B. Jonah, St. Louis, is chief engineer in charge of plans.

TULSA, OKLA.—Superheat Products Co., capital $25,000, chartered by P. C. Hughes 1516 East Sixth street, E. C. Hughes and L. O. Prickett to manufacture gas burners and appliances.

TULSA, OKLA.—Frisco railroad announces early removal of repair shops from Sapulpa, Okla., to Tulsa and enlargement of shops and yards on new site near Red Fork, Okla., a suburb. F. G. Jonah, Frisco building, St. Louis, is chief engineer.

TULSA, OKLA.—Gas Engineering & Construction Co., agents for Clark Bros. engines, announce contract for 26 165-horsepower gas engine compressors for Phillips Petroleum Co. at Broger, Tex., also 3 165-horsepower engines for Empire Gasoline Co. at Seminole, Okla., and eight 80-horsepower engines for Indian Territory Ill. Oil Co. gas lift station at Seminole, Okla.

AUSTIN, TEX.—Board of regents, University of Texas, are asking bids until Jan. 18 for construction of a modern power plant. Plans and specifications may be obtained from Herbert M. Greene Co., Santa Fe building, Dallas, Tex., architects.

BEAUMONT, TEX.—Continental Supply Co. has contracted to build a sectional steel warehouse, 40x175 feet, for storage of oil field supplies.

DALLAS, TEX.—Black Hawk Corp., capital $10,000, incorporated to handle metal products by Frederick Jones, Insurance building, A. C. Dennis and Ida Dennis.

FORT WORTH, TEX.—Texas & Pacific railroad will shortly start construction of new freight and passenger terminals, also a repair shop and roundhouse on 1700-acre site recently secured west of city. E. F. Mitchell, Huey-Philip building, is chief engineer in charge.

PAMPA, TEX.—C-G Motor & Accessories Corp., capital $20,000 incorporated by J. J. Crume, R. M. Gaines and P. R. Underwood to build and operate modern garage including repair shop.

PANHANDLE, TEX.—Panhandle Tank Co., capital $1,000, incorporated by A. L. Scudder, J. R. Stegall and Hal Peck to deal in tanks for oil field service.

TEMPLE, TEX.—Love Construction Co., Dallas, was awarded contract for power plant for Scott & White hospital at $25,000 bid. Equipment contracts were awarded some time ago.

WICHITA FALLS, TEX.—Star Drilling Machine Co., Akron, O., has taken out state permit to do business in Texas with H. J. Larrick named as state manager. A warehouse and repair plant is contemplated.

CONSHOHOCKEN, PA.—Alan Wood, Iron & Steel Co. will electrify its East mill here and add considerable equipment.

COCHRANTON, PA.—Nonpareil Mfg. Co., manufacturer of agricultural implements, will rebuild the burned portion of its plant.

GLENWOOD, PA.—Baltimore & Ohio railroad, L. P. Kimball, engineer, Baltimore, will build an addition to its machine shop and engine house here.

HARRISBURG, PA.—Standard Iron & Steel Co. will build a 2-story plant 40x100 feet for a storage and distributing plant.

PHILADELPHIA—Bids were opened recently by the Stunzi Silk Co. for a mill building at Ephrata, Pa. The Lockward-Greene Co., New York City, is architect in charge.

PHILADELPHIA — Contract for $51,000 plant addition for Joseph Greer Inc., 4528 Worth street, has been awarded to the William F. Newberry Co., Otis building.

PHILADELPHIA—Bids will be received Dec. 30 by the Philadelphia Electric Co. on a substation at Washington and Twenty-fourth streets and Dec. 28 for another at Ninth and Willow.

PHILADELPHIA—Contract for a $50,000 mill building for the Whitehall Knitting Co., Gillingham street, has been awarded to the George Kessler Contracting Co., 1733 North Marvin street.

PHILADELPHIA—The department of city transit has awarded contracts to the Curtis Grindrod Co., 10 South Eighteenth street, for two substations, costing in the aggregate $249,000. One station will be erected at Louden and Carlisle streets and the other in Cumberland street.

PHILADELPHIA—Philadelphia Motor Service Co. has awarded a contract for a $300,000 motor repair shop, Columbia avenue between Front and Blair streets, to the George Kessler Contracting Co. According to plans by Andrew J. Sauer & Co., structure will be four stories high, steel and reinforced concrete, 114x109x183 feet.

PITTSBURGH—Pittsburgh Auto Spring Co., 5913 Center avenue, owned by J. G. Hinds and W. S. Kimball, will rebuild the burned portion of its plant and replace damaged machine equipment.

CHARLEROI, PA.—Charleroi Steel & Foundry Co., John K. Tener president, has made

arrangements for a plant which it will equip and start production shortly.

COLUMBIA, PA.—Keeley Stove Co. will build a 3-story addition to its plant for which additional equipment will be required.

DANVILLE, PA.—Danville Iron & Steel Co., F. O. Reedy, superintendent, will convert steel mill building into a foundry to replace one recently burned. Modern equipment will be installed.

EDDYSTONE, PA.—Baldwin Locomotive Works has closed on structural steel for a plant addition to the Belmont Iron Works.

EPHRATA, PA.—Plans have been completed for a factory for the Stunzi Sons Silk Co. Lockwood Green & Co., New York City, are architects in charge.

PHILADELPHIA—Bids will be closed Dec. 14 on a substation at Louden and Carlisle streets, by the department of city transit.

PHILADELPHIA—Belmont Iron Works, Washington and Twenty-second streets, will build a new craneway at its plant.

PHILADELPHIA—Alloy Steel Corp., recently incorporated will establish a warehouse and fabricating plant at Camden, N. J., next year.

PHILADELPHIA—New Famous Chandelier Co., 2168 East Firth street, has let contract to H. F. Brown, 6127 Ridge street, for a 1-story addition for the manufacture of electrical fixtures and fitings.

PHILADELPHIA—Baldwin Locomotive Works, 500 North Broad street, is having plans made for a locomotive tender shop at its Eddystone works and a 6-story administration building 150 x 200 feet at the same plant.

PHILADELPHIA—Philadelphia Motor Service Co., Buttonwood and Nineteenth streets, will build a new plant at Columbia avenue and Front street, 110 x 180 feet, four stories. Equipment will be required.

PITTSBURGH — Steel Products Co. has been incorporated with $25,000 capital to manufacture iron and steel products by David McG. Witherow, 5518 Raleigh street, Kenneth M. Hagan and Walter G. Smith.

POTTSTOWN, PA.—Pottstown Pipe Products Co., manufacturer of iron pipe, will build a 1-story addition 56 x 75 feet.

ROCHESTER, PA.—Guarantee Liquid Measure Co., manufacturer of gasoline measuring pumps, is having plans made for a power house in connection with the new plant now being erected.

SCRANTON, PA.—Scranton Bed & Spring Mfg. Co., Max Rubin manager, 310 Centre street, is considering erection of a 2-story plant at Franklin avenue and Vine street.

SHOEMAKERSVILLE, PA.—Keystone Washing Machine Co. has been incorporated with $50,000 capital to manufacture washing machines, electrical appliances by Abraham B. Lesher treasurer, John B. Lesher president, Williamstown, Pa., and Milton O. Koontz secretary, Reading, Pa.

TAMAQUA, PA.—Atlas Powder Co., Wilmington, Del., will build additions to its plant here, including a powder house and new units for cap and fuse production.

WILLIAMSPORT, PA.—Williamsport Wire Rope Co. is having plans made for an addition to its factory branch at Chattanooga, Tenn. F. R. Saunders is manager at Chattanooga.

YORK, PA.—H. L. Neuman Co., care Edward Neuman, 30 South Mulberry street, is having plans drawn for a 3-story repair shop and warehouse 70 x 140 feet on King Mill road. Paul Hostetter Co., Inc., Summer street, is engineer.

PROVIDENCE, R. I.—Read & Lundy Inc. has been incorporated with 100 shares no par value to manufacture machines, tools and electrical supplies by Frederick A. Read, William S. Lundy and Harold W. James.

BRISTOL, TENN.-VA.—Crymble Electric Co. Inc. has been incorporated with $25,000 capital to manufacture electrical supplies and appliances by Carter Crymble and M. A. Sanders.

NASHVILLE, TENN.—Allen Mfg. Co., Tenth and Cedar streets, general machine shop, is having plans made for an addition to its plant.

Business in Canada

CAMPBELLFORD, ONT.—It is announced that arrangements have been completed whereby National Steel Castings, Ltd., a new concern, will establish a plant here to manufacture steel and alloy castings by the electric furnace process.

HAMILTON, ONT.—Frost Steel & Wire Co. has purchased the buildings and property here formerly held by the Petrie Co. and proposes to make considerable changes in its plant to cope with increasing demand for its products.

KIRKLAND LAKE, ONT.—Telluride Co. plans the construction of a mill in connection with its mining property here.

KIRKLAND LAKE, ONT.—Wright-Hargreaves Co. proposes to enlarge mining mill and make other improvements to property here.

MATHESON, ONT.—It is officially reported that the Blue Quartz gold mines, will build a mill here, on which construction work will be started next May.

NIAGARA FALLS, ONT.—Plans are being prepared and construction work will be started early next spring on a $200,000 addition to the plant of the Kardex-Rand Co., Bender Hill, here.

SMITHVILLE, ONT. — Riordon Plating Works, Hamilton, Ont., has purchased the plant of the Smithville Metal Industries, here, and will continue the manufacture of automobile bumpers and bumperettes. The recently acquired plant consists of two buildings, one 50 x 100 feet and the other 24 x 24 feet.

TILBURY, ONT.—Canadian Top & Body Co. will build addition to No. 2 plant here.

LIMOILOU, QUE.—W. I. Bishop & Co., Ltd., 10 Cathcart street, Montreal, Que., who have the general contract for the construction of $15,000,000 paper mills here for the Anglo Canadian Pulp & Paper Co., 71 St. Peter street, Quebec, Que., are asking for prices on reinforcing steel required for the mills. The general contractors will also let sub-strades in connection with the project.

STE. ANNE DE BEAUPRE, QUE.—The W. I. Bishop Co., Ltd., 10 Cathcart street Montreal, Que., who have the general contract for $10,000,000 paper mill and power plant here for the St. Anne Power & Paper Co., are asking for prices on reinforcing steel required in the construction of the plants. The contracts will also let sub-trades.

New Trade Publications

ELECTRIC FURNACES—W. S. Rockwell Co., New York, has issued a bulletin covering its revolving rotary type electric furnaces for use in heat treating metal parts. It is illustrated and its mode of operation is described fully.

STEEL LIFT TRUCKS—A list of parts for its steel lift trucks has been issued by the Stuebing-Cowan Co., Cincinnati. The various parts are listed, illustrated and described and a list of accessories and specialties also is given, with instructions for ordering.

REGISTERS—Calling it "The Register Book," the Auer Register Co., Cleveland, has published a booklet containing full information about its registers for use with hot air heating units. The registers are illustrated and data on their use are given.

STEAM DROP HAMMERS—Chambersburg Engineering Co., Chambersburg, Pa., has issued a bulletin describing its steam drop hammers, which also can be operated by compressed air. It is illustrated by halftones of the machines and parts and engineering data.

MILLING MACHINES—Kearney & Trecker Corp., West Allis, Wis., has issued a bulletin calling attention to features of its new models of milling machines, illustrating the special features of construction that make them better suited to production work.

ELECTRICAL DEVICES—Esterline Angus Co., Indianapolis, has issued a leaflet describing some new developments in its measuring and recording instruments. These include a heavy-duty meter element, a movable scale and a spring motor quick trip.

BALL BEARINGS—Ball bearings in electric motors to eliminate wear and with arguments for their use form the subject matter of a bulletin by the New Departure Mfg. Co., Bristol, Conn. Motors placed at angles to horizontal or perpendicular are shown, with advantages of ball bearings in such use.

BABBITT METAL—A booklet published by the Hoyt Metal Co., St. Louis, contains data on babbitt metal for the use of engineers and others having to do with machinery using metal for bearings. A table is presented, showing the physical characteristics of its various brands of babbitt metal, of great value in choosing the proper brand for a given use.

STEEL CASTINGS—Another in its series of bulletins describing steel castings for specific purposes has been issued by the Sivyer Steel Casting Co., Milwaukee. Sliding castings replacing trolley wheels and cutting dies form the subject of the current bulletin. Longer life and lessened costs are shown as arguments for the use of cast steel.

DROP FORGINGS—J. H. Williams & Co., Buffalo, will issue a new catalog in January, covering its complete line of stock goods. It will be much changed from previous issues and will contain much new matter. It will be issued in two sizes, 7½ x 10½ and a pocket size 4 x 6 inches. It covers its line of wrenches, pipe tongs, in alloy and plain steel, in various finishes and unfinished.

Sheet Extras and Differentials

Black Sheets

Gage Differentials

Gage	Per 100 Lbs.
30	Add 50c
29	Add 40c
28	Add 25c
27	Add 15c
25-26	Add 10c
24	Base
21-23	Deduct 5c
18-20	Deduct 20c
15-17	Deduct 30c
12-14	Deduct 35c
10-11	Deduct 45c

BLACK EXTRAS FOR WIDTH

Gages	Under 12 inches to 6 inches	Under 24 inches to 12 inches	24 inches to 32 inches	Over 32 inches to 36 inches	Over36 inches to 40 inches	Over 40 inches to 44 inches	Over 44 inches to 48 inches
10 to 16	0.20	0.10	Base	Base	Base	Base	Base
17 to 18	0.25	0.15	Base	Base	0.05	0.05	0.05
19 to 21	0.25	0.15	Base	Base	0.15	0.15	0.25
22 to 24	0.25	0.15	Base	Base	0.20	0.40	0.40
25 to 27	0.30	0.20	Base	Base	0.20	0.40	...
28	0.30	0.20	Base	0.10	0.40	...	...
29 to 30	0.30	0.20	Base	0.10	...	...	...

BLACK EXTRAS FOR LENGTH

Gages	Under 30 inches to 18 inches	Under 60 inches to 30 inches	60 inches to 124 inches	Over 124 inches to 144 inches
10 to 16	0.15	0.10	Base	Base
17 to 18	0.25	0.15	Base	0.10
19 to 21	0.25	0.15	Base	0.10
22 to 24	0.25	0.15	Base	0.10
25 to 30	0.30	0.20	Base	0.10

Galvanized Sheets

Gage Differentials

Gage	Per 100 Lbs.
30	Add 90c
29	Add 70c
28	Add 50c
27	Add 35c
25-26	Add 25c
24	Base
21-23	Deduct 15c
19-20	Deduct 20c
18	Deduct 35c
15-17	Deduct 50c
12-14	Deduct 60c
10-11	Deduct 70c

GALVANIZED EXTRAS FOR WIDTH

Gages	Under12 inches to 6 inches	Under 24 inches to 12 inches	24 inches to 32 inches	Over 32 inches to 36 inches	Over 36 inches to 40 inches	Over 40 inches to 42 inches	Over 44 inches to 44 inches	Over 48 inches to 52 inches	Over 52 inches to 54 inches
10 to 15	0.25	0.20	Base	Base	Base	0.10	0.20	0.30	0.40
16	0.25	0.20	Base	Base	0.10	0.10	0.20	0.35	0.50
17 to 17	0.30	0.20	Base	Base	0.10	0.10	0.20	0.35	0.50
19 to 21	0.30	0.20	Base	Base	0.20	0.30	0.40	0.50	0.75
22 to 24	0.30	0.20	Base	Base	0.20	0.40	0.60	...	...
25 to 26	0.35	0.25	Base	Base	0.30	0.60	...	...	...
27	0.35	0.25	Base	0.10	0.50	0.75	...	...	...
28	0.35	0.25	Base	0.20	0.60	...	...	...	...
29 to 30	0.35	0.25	Base	0.20	...	...	...	...	...

GALVANIZED EXTRAS FOR LENGTHS

Gages	Under 30 inches to 18 inches	Under 60 inches to 30 inches	60 to 124 inches	Over 124 inches to 144 inches	Over 144 inches to 168 inches	Over 168 inches to 180 inches	Over 180 inches to 192 inches	Over 192 inches to 216 inches	Over 216 inches to 228 inches
10 to 12	0.20	0.10	Base	Base	0.50	0.60	0.60	0.75	1.00
13 to 14	0.20	0.10	Base	Base	0.50	0.75	0.75	1.00	1.50
15 to 16	0.20	0.10	Base	Base	0.50	0.75	...	...	...
17 to 24	0.30	0.20	Base	0.10	...	...	...	...	...
25 to 30	0.35	0.25	Base	0.10	...	...	...	...	...

STANDARD MISCELLANEOUS EXTRAS

	Extra per 100 pounds
Blued range steel	$0.70
Blued range steel patent leveled	0.95
Blued stove pipe stock, 25 gage and lighter	0.20
Blued stove pipe stock, 24 gage and heavier	0.50
Enameling stock, pickled and annealed finish	0.50
Deep stamping or drawing	0.25
Extra deep stamping or drawing	0.50
Extra box anneal	0.15

Blue Annealed Sheets

GAGE DIFFERENTIALS

Gage	Price per 100 pounds
8 and heavier	Less $0.05
9 and 10, carload quantities	Base
11 and 12	0.05
13 and 14	0.10
15 and 16	0.20

EXTRAS FOR WIDTH

Gage	Extra per 100 pounds
16 and heavier under 24 to 12-inch	$0.10
16 and heavier under 12 to 6-inch	0.15
16 and heavier under 24-inch and wider	None

EXTRAS FOR LENGTH

Gage	Extra per 100 pounds
16 and heavier, 60-inch and longer	None
16 and heavier, under 60 to 30-inch	0.10
16 and heavier, under 30 to 18-inch	0.15
Deoxidizing	0.15
Extra deep stamping or drawing	0.50
Full cold rolled and reannealed	0.25
Full pickled, full cold rolled and reannealed	0.75
Lime finish	0.10
Long ternes, special finish	0.75
Oiling	0.10
Patent or stretcher leveling	0.25
Pickled, annealed, cold rolled and reannealed for tinning	0.50
Resquaring, 5% of price of sheet at time of resquaring.	
Roller leveling	0.10
Single pickled	0.45
Single pickled, cold rolled and reannealed	0.50
Single pickled, oiled or lime finish	0.35
Carbons over 0.25 to 0.40 per cent	0.10
Carbons over 0.40 to 0.60 per cent	0.25
Carbons over 0.60 to 0.90 per cent	0.40
First grade metal furniture stock, full pickled, full cold rolled, reannealed, stretcher leveled, not resquared	1.00
Second grade metal furniture stock, single pickled, full cold rolled reannealed, stretcher leveled, not resquared	0.85

Automobile Sheets

	Primes with seconds up to 15% per 100 lbs.
Automobile body stock	Base, 22 gage
Auto body stock, deep stamping	0.25
Auto body stock, extra deep stamping	0.50
Hood, flat fender, door and apron, or splash guard stock	0.25
Crown fender, cowl and radiator casing, deep stamping	0.50
Crown fender, cowl and radiator casing, extra deep stamping	0.75

Price of seconds, 10 per cent less than the invoice price for corresponding primes.

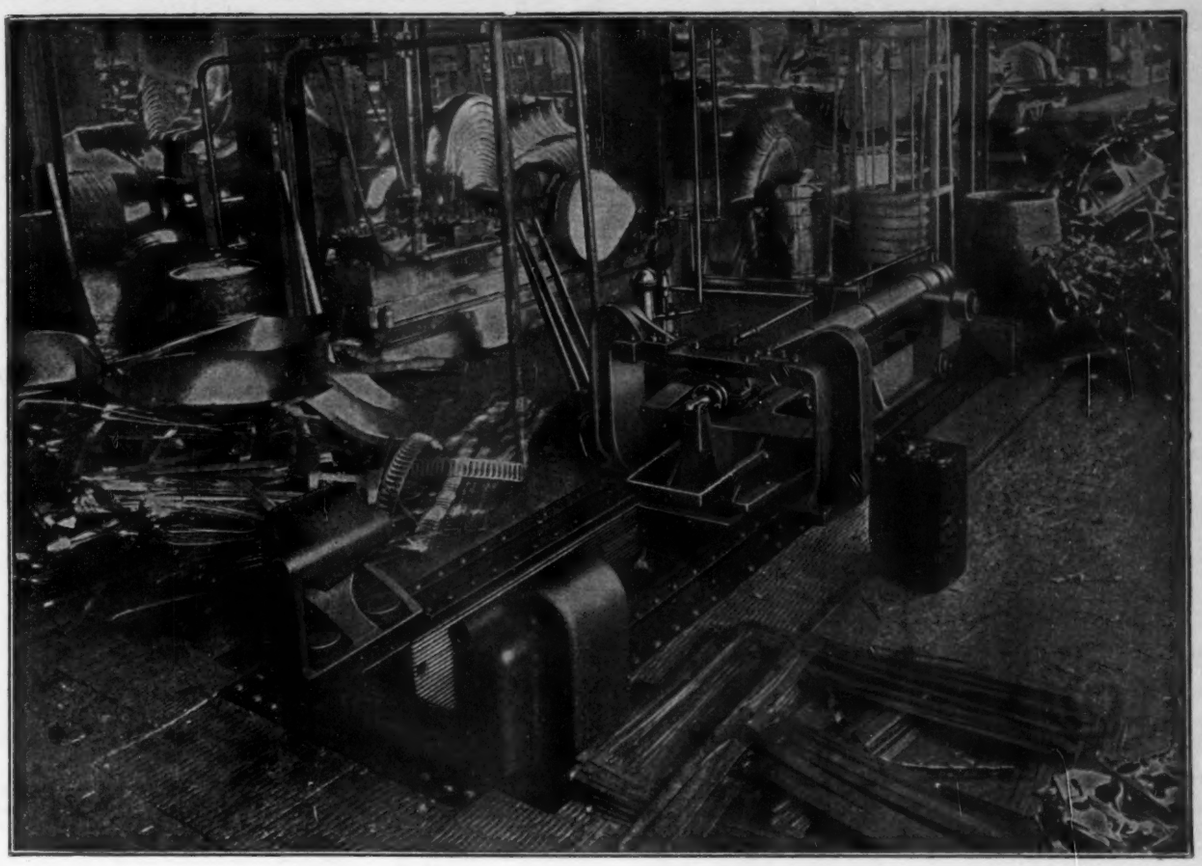
EXTRAS FOR EXTREME WIDTHS

	Per 100 lbs.
10-16 gage over 36 inches to 44 inches	0.10
10-16 gage over 44 inches to 48 inches	0.35
10-16 gage over 48 inches to 52 inches	0.50
17-18 gage over 36 inches to 44 inches	0.10
17-18 gage over 44 to 48 inches	0.20 to 0.35
17-18 gage over 48 inches to 52 inches	0.60
18 gage and heavier under 24 to 12 inches	0.15
18 gage and heavier under 12 to 6 inches	0.25
19 gage and lighter under 24 to 12 inches	0.15
19 gage and lighter under 12 to 6 inches	0.25
19-21 gage over 36 inches to 44 inches	0.30
19-21 gage over 44 inches to 48 inches	0.50
22-24 gage over 36 inches to 40 inches	0.40
22-24 gage over 40 inches to 44 inches	0.80

Black sheet extras to apply on narrow widths.

EXTRAS FOR LENGTHS

	Price per 100 pounds
16 gage and heavier over 60 inches to 144 inches	Base
16 gage and heavier under 60 inches to 30 inches	$0.10
16 gage and heavier under 30 inches to 18 inches	0.15
17 to 24 gage over 24 inches to 144 inches	0.10
17 to 24 gage under 60 inches to 30 inches	0.15
17 to 24 gage under 30 inches to 18 inches	0.25
25 gage and lighter over 24 inches to 144 inches	0.10
25 gage and lighter under 60 inches to 30 inches	0.20
25 gage and lighter under 30 inches to 18 inches	0.30



Typical Installation in Well-Known Automobile Plant

WHY SHEET-SCRAP CAN BE PROFITABLY COMPRESSED

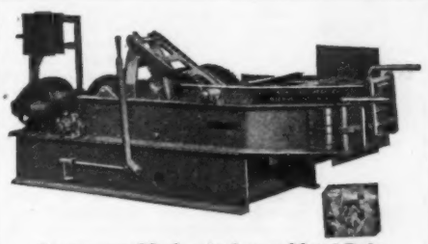
It commands at all times the best price;
It can be more conveniently stored;
It can be more economically handled;
It can be readily held for favorable markets;
It practically eliminates corrosion;
It permits of loading cars to capacity;
It saves much heat in remelting.

LOGEMANN SCRAP-METAL PRESSES

Hydraulic and Mechanical Types

LOGEMANN BROTHERS COMPANY
3126 Burleigh St. Milwaukee, Wis.

Also presses making crucible-size bricks of copper, brass, aluminum and other metals.



Logemann Mechanical-type Metal Baler

Please indicate character of scrap, quantity and heaviest gauge, when writing.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	46	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	58	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	33	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾ to 1½-inch	30	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
8 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾ to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	3

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
4¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¾ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates not Exceeding 72 inches Wide

Plates less than ¼-inch gage, to and including ⅜-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot..... .20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including ⅜-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

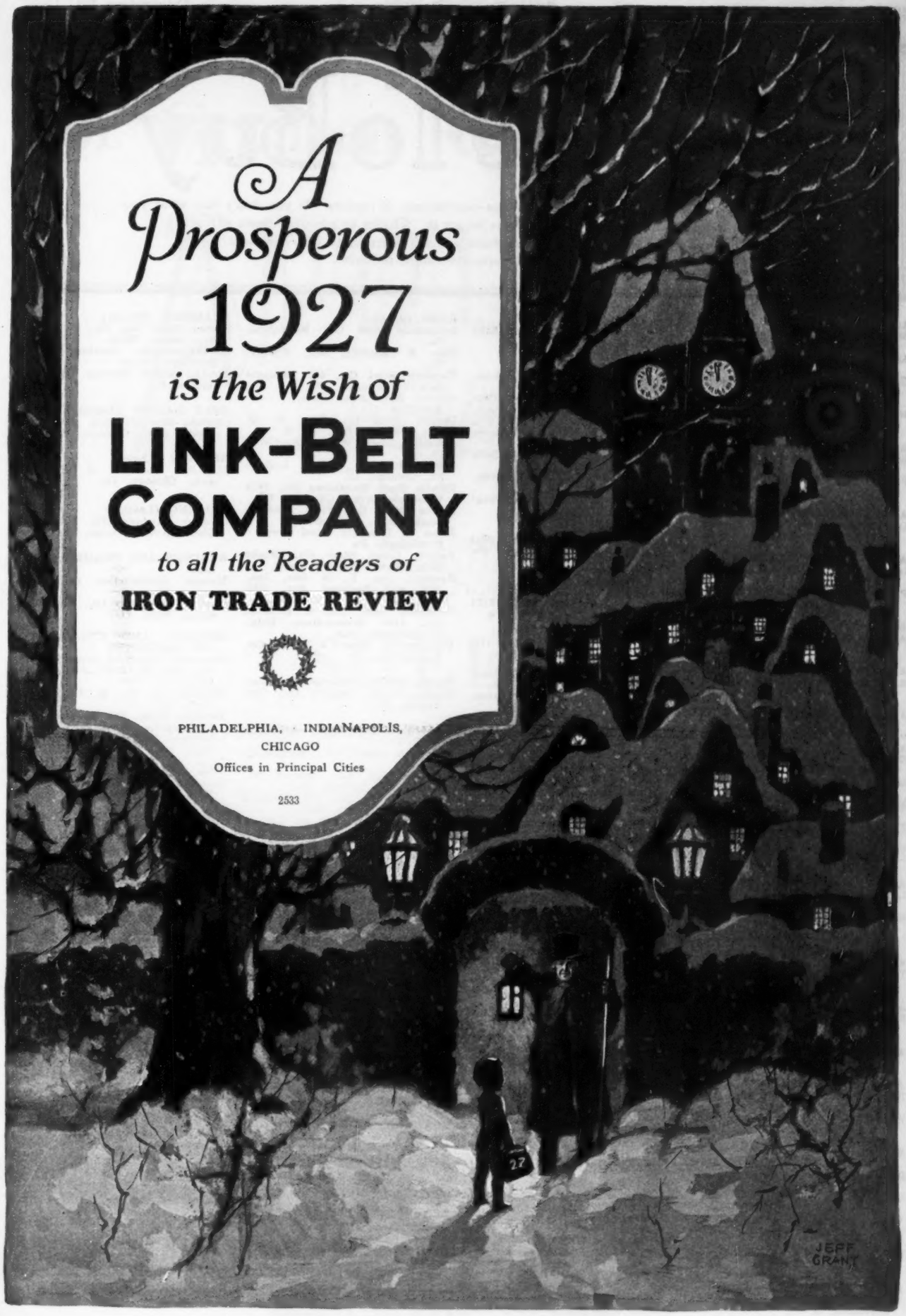
With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared wiht re-entrant angles)

Additional extra ..... .20c


A Prosperous 1927
is the Wish of
LINK-BELT COMPANY
to all the Readers of
IRON TRADE REVIEW
PHILADELPHIA, INDIANAPOLIS,
CHICAGO
Offices in Principal Cities
2533
JEFF GRANT

"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶Index to advertisements will give you page number of any advertisers and by referring to advertisement you can get full particulars about products.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
Internaitonal Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

ALUMINUM (Vanadium)
Vanadium Corp., of America, 120 Broadway, New York City.

ALUMINUM TUBING
Summerill Tubing Co., Bridgeport, Pa.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Pittsburgh Malleable Iron Co., 34th & Smallman Sts., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Zanesville Malleable Co., Zanesville, O.

ANTIGLARE PREPARATION
Skybryte Co., The, Keith Bldg., Cleveland, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Cox & Sons Co., The, Bridgeport, N. J.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BAND SAWS (Metal Cutting)
Huther Bros. Saw Mfg. Co., 1190 University Ave., Rochester, N. Y.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARS (Alloy)
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BARS (Concrete Reinforcements)
Bethlehem Steel Co., Bethlehem, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Truscon Steel Co., Youngstown, O.

BARS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Republic Iron & Steel Co., Youngstown, O.
Truscon Steel Co., Youngstown, O.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS, STEEL (Electric Furnace)
Timken Roller Bearing Co., The, Canton, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Blystone Mfg. Co., Ironton St. Cambridge Springs, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BEARINGS (Ball)
Hoover Steel Ball Co., Ann Arbor, Mich.
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Hyatt Roller Bearing Co., Newark, N. J.
Keystone Bronze Co., 39th St., Pittsburgh, Pa.

BEARINGS (Motor)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.

BEARINGS (Roller)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Timken Roller Bearings Co., The, Canton, O.

BEARINGS (Thrust)
Hoover Steel Ball Co., Ann Arbor, Mich.
Norma-Hoffman Bearings Corp., Stamford ,Conn.
Timken Roller Bearing Co., The, Canton, O.

BELT LACING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

BELTING (Chain)
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

BELTING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Forging)
Bethlehem Steel Co., Bethlehem, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BILLETS (Tool Steel)
Union Electric Steel Corp., Frick Bldg., Pittsburgh, Pa.

BILLETS AND BLOOMS
American Rolling Mill Co., Middletown, O.
American Tube & Stamping Plant, The, Stanley Works, The, Bridgeport, Conn.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Illinois Steel Co., 208 South La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below

For Greater Rust Resistance

APOLLOY
METAL

COPPER CONTENT

BLUE ANNEALED
ONE PASS COLD ROLLED—GALVANIZED
SINGLE PICKLED

SHEETS

Leading Railroads use **"Apolloy Metal"** for Roofing and New Car Construction.

Burial Vault and Casket Makers specify **"Apolloy Metal"** for greater durability underground.

Engineers and Contractors for greater rust-resistance in building construction.

State Highway Departments and United States Bureau of Public Roads, Government Forestry and Reclamation Services for Culverts and Flumes.

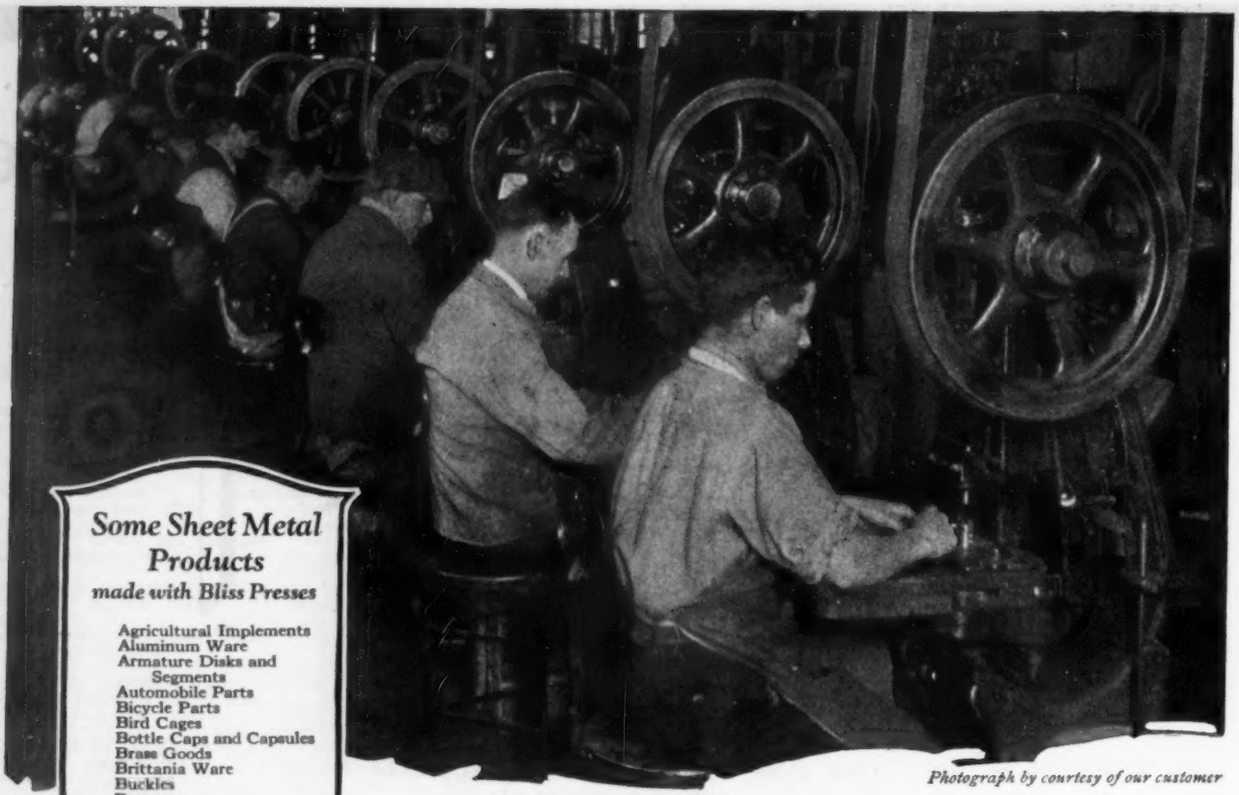
Sheet Metal Workers for all purposes such as cornices, gutters, down spouts —in short wherever the finished work will be exposed to atmospheric corrosion.

District Sales Offices

BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILL.
CINCINNATI, O.
CLEVELAND, O.
DETROIT, MICH.
LYNCHBURG, VA.
MEMPHIS, TENN.
NEW ORLEANS, LA.
NEW YORK, N. Y.
PHILADELPHIA, PA.
SAN FRANCISCO, CAL.
SYRACUSE, N. Y.

Contributing Member
SHEET STEEL
TRADE EXTENSION COMMITTEE

Apolloy for APOLLO Permanence
STEEL COMPANY
APOLLO — PA.



Photograph by courtesy of our customer

Some Sheet Metal Products
made with Bliss Presses

Agricultural Implements
Aluminum Ware
Armature Disks and Segments
Automobile Parts
Bicycle Parts
Bird Cages
Bottle Caps and Capsules
Brass Goods
Brittania Ware
Buckles
Burners
Butter Tins
Cash Registers
Cigarette Boxes
Clocks
Coal Hods
Collapsible Tubes
Cooking Utensils
Cornice Work
Cuspidors
Cutlery
Dental Instruments
Dinner Pails
Drip Pans
Door Knobs
Drop Forgings
Druggists' Tinware
Dust Pans
Electrical Goods
Elevator Buckets
Enamel Ware
Expanded Metal Lath
Fish Cans
Forks
Fruit Cans
Fry Pans
Furniture (Metal)
Gas Fixtures
Gas Ranges
Gun Parts
Hammers
Hardware
Harness Trimmings
Hinges
Horse Shoes
Jewelry
Kitchen Boilers
Kitchen Utensils
Lamps
Lanterns
Lard Pails
Locks
Match Boxes
Meat Cans
Medals
Metallic Ceilings
Metal Lath
Metal Radiators
Musical Instruments
Oil Cans
Oil Stoves
Perforated Metal
Paint Cans
Paint Tubes
Petroleum Cans
Pick-eyes
Pieced Tinware

BLISS

Since 1857

A busy line-up

Bliss Presses in action always present a mighty busy scene—delivering a constant stream of finished parts frequently ranging upwards of many thousands per hour. Here, for example, we see a battery of eight Bliss No. 18 and two No. 19 Inclinable Presses forming and blanking small parts used in the manufacture of electric light fixtures. The parts are stamped from strips of sheet steel, brass, copper, fibre, and pressboard varying from .010 in. to ¼ in. in thickness.

The large variety of the work being turned out by this equipment is typical of the adaptability and flexibility of Bliss Presses. Frequently a single Bliss Press is used for many different operations on a variety of sheet metal and composition parts—an opportunity for economical production that goes far in reducing manufacturing costs.

Investigate the possibilities of Bliss equipment in *your* plant.

E. W. BLISS CO. BROOKLYN N. Y., U. S. A.

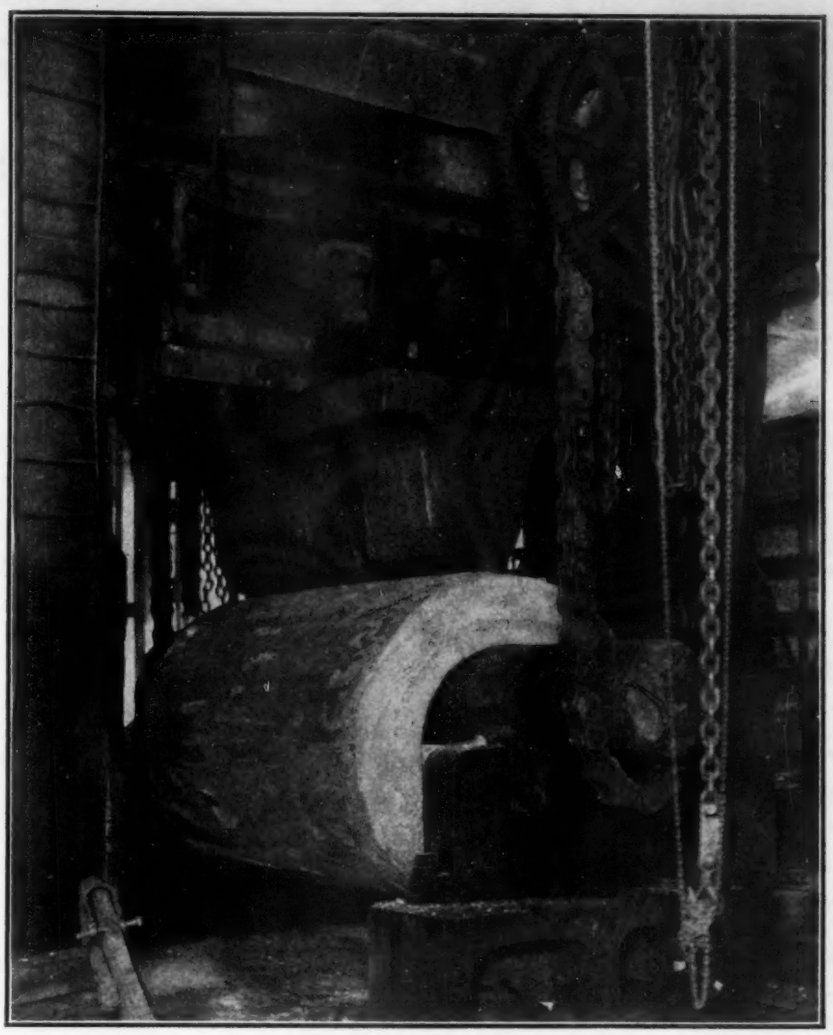
Factories: BROOKLYN, N. Y. HASTINGS, MICH. SALEM, O. CLEVELAND, O.
Sales Offices: DETROIT CLEVELAND CHICAGO PITTSBURGH PHILADELPHIA ROCHESTER CINCINNATI NEW HAVEN
Foreign Factories and Offices: LONDON, ENG. TURIN, ITALY PARIS, FRANCE

BLISS

PRESSES - DIES - SPECIAL MACHINERY

No. 528

Forgings



Castings

Bethlehem foundries are equipped to make all types and sizes of castings of carbon and alloy steel, gray iron, Mayari iron mixtures, brass and bronze.

THE illustration above shows a massive steel ingot in the process of being forged under the 14,000-ton hydraulic press at the Bethlehem Plant of Bethlehem Steel Company.

Bethlehem's forge shops are equipped to make small drop forgings as well as large solid or hollow hammered and hydraulically pressed forgings in any quantity.

Bethlehem facilities provide for rough and finish machining all work.

BETHLEHEM STEEL COMPANY—General Offices: BETHLEHEM, PA.

District Offices:

New York, Boston, Philadelphia, Pittsburgh, Buffalo, Baltimore, Washington, Cleveland, Cincinnati, Atlanta, Detroit, Chicago, St. Louis, Portland, Seattle, San Francisco, Los Angeles

Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporters of Our Commercial Products

BETHLEHEM

Great Shipment of May-Tag Washing Machines

REPUBLIC

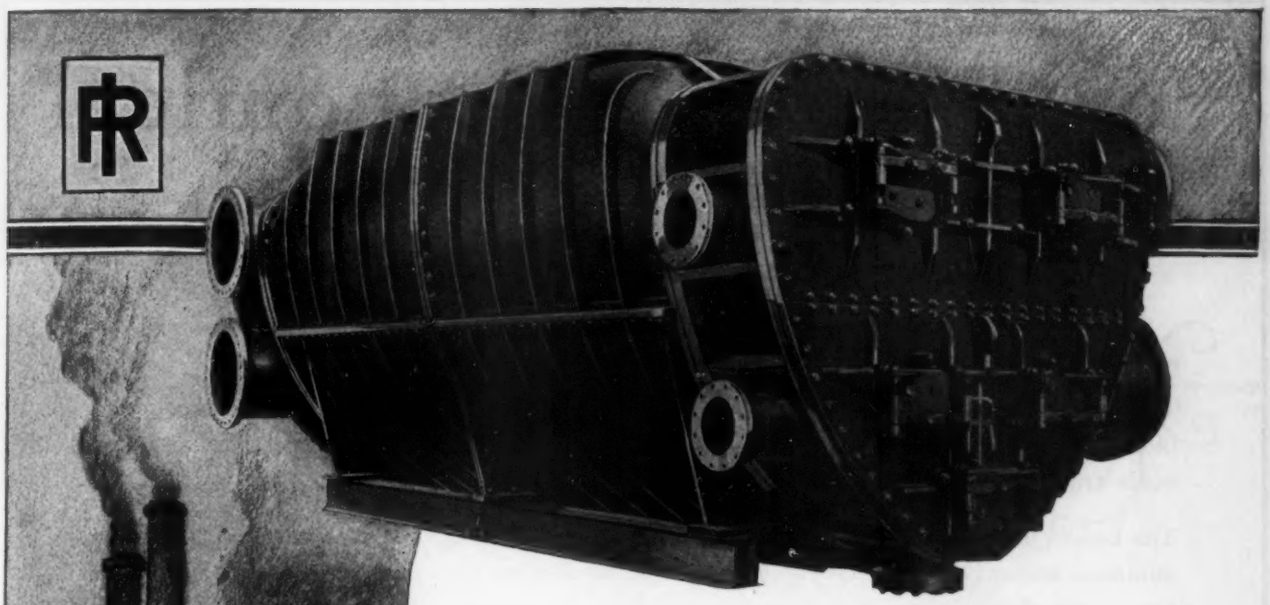
Recently five solid train-loads of May-Tag Washing Machines left Newton, Iowa, in a single day en route to eastern dealers. The valuation exceeded $2,000,000.00. A considerable quantity of Republic's well-known products are used in the manufacture of the May-Tag Machine.

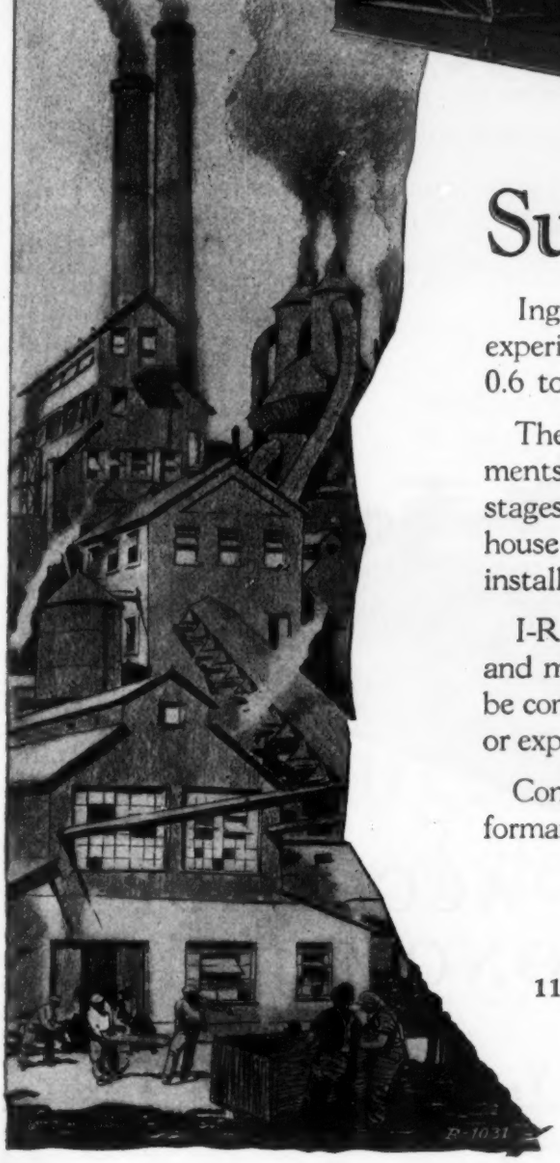
REPUBLIC IRON & STEEL COMPANY

General Offices: Republic Bldg. Youngstown, Ohio

Sales Offices:

Birmingham, Buffalo, Cincinnati, Boston, Cleveland, St. Louis, Chicago, Dallas, New York, Philadelphia, Detroit, Pittsburgh, Denver, San Francisco





Surface Condensers

Ingersoll-Rand Company is the oldest and most experienced builder of surface condensers operating on 0.6 to 0.7 sq. ft. of surface per kw. of turbine capacity.

These condensers represent the most modern improvements in condenser design. They have passed through those stages of development common to all successful power house equipment,—namely, research, experiment, first installations, subsequent installations, and repeat orders.

I-R Condensers have the advantages of low height and more compact foundations. In some cases, they can be completely suspended from the turbine without springs or expansion bolts.

Consult with our engineers regarding long-period performance records of Ingersoll-Rand Condensers.

Write for literature.

INGERSOLL-RAND COMPANY
11 Broadway · · · New York City

Offices in principal cities the world over

For Canada Refer—Canadian Ingersoll-Rand Co., Limited,
260 St. James Street, Montreal, Quebec

27-SC

Ingersoll-Rand

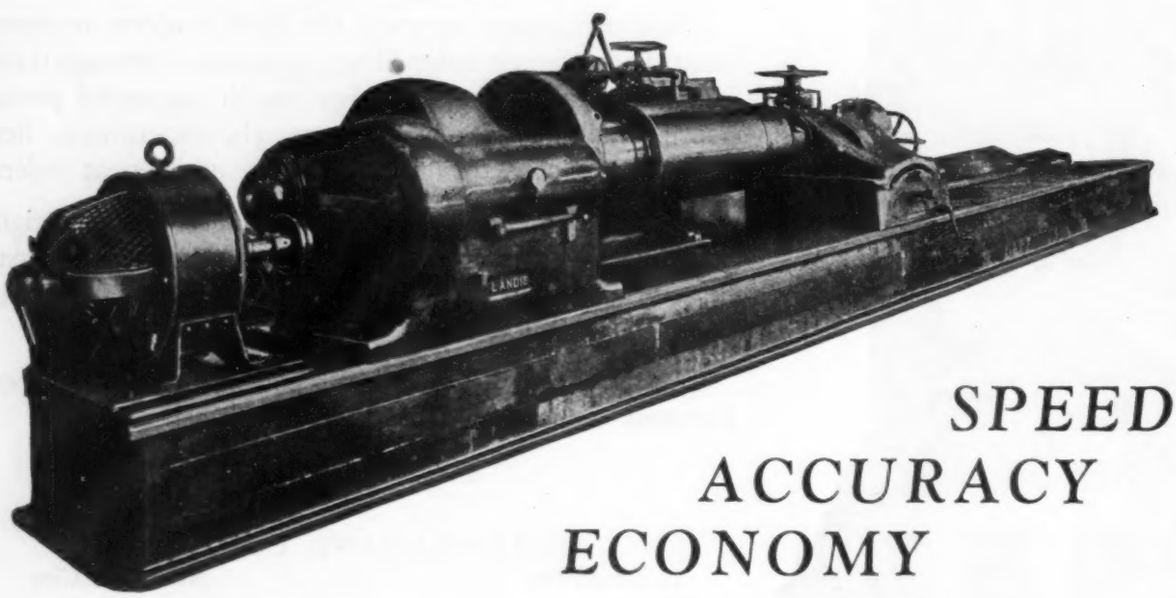
For Fast and Economical Roll Grinding

The grinding of steel rolls for tin plate, sheet or plate mills is a necessary step in the production of a high grade product. The old objection to grinding, that it was too expensive, no longer holds true.

The Landis Roll Grinder is designed so as to do this grinding rapidly, economical and with the minimum amount of labor. Grinding wheel costs are now less than $.20 per roll. The production time is less than it has ever been previous to the development of this machine.

In every case decreased cost, increased production and higher grade product has followed immediately after the installation of a Landis Roll Grinder.

We can give you some very interesting and profitable information on Roll Grinding. Consult us at your convenience.



SPEED
ACCURACY
ECONOMY

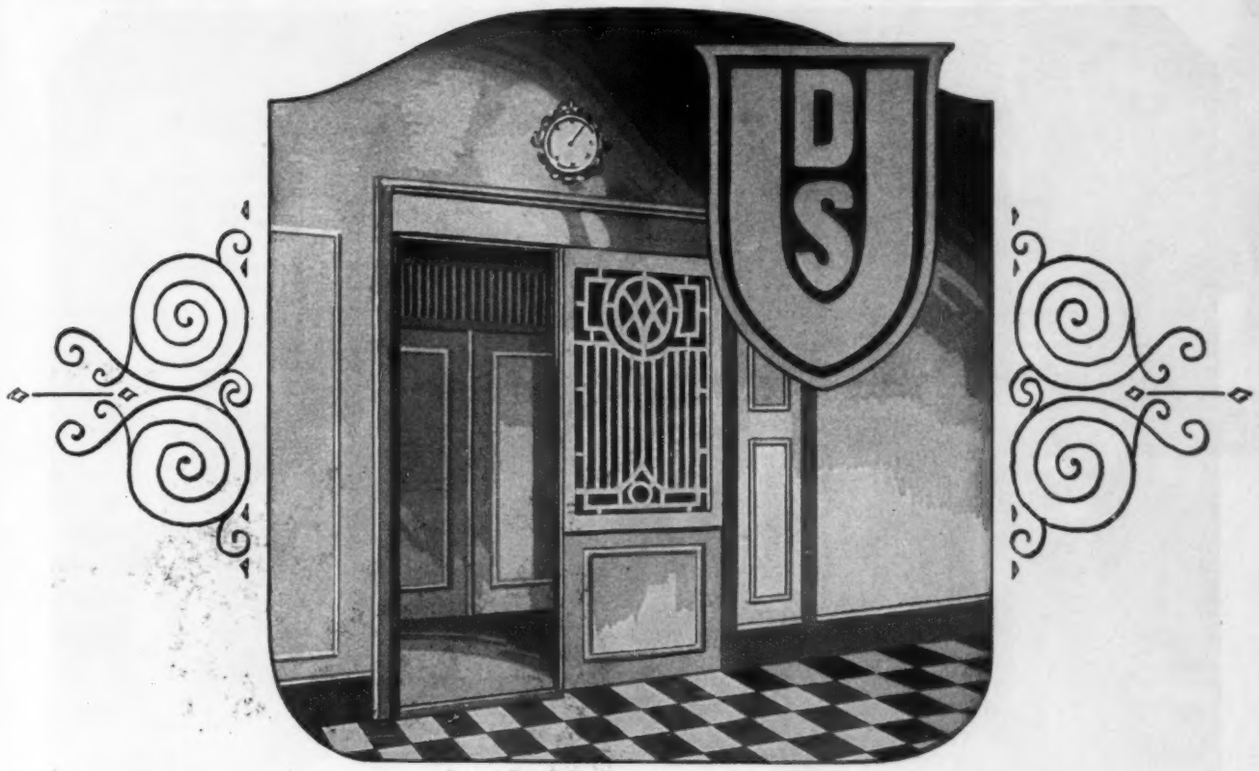
LANDIS TOOL COMPANY, Waynesboro, Pa.

Chicago Office: 618 W. Washington Blvd. New York Office: 2907 Singer Bldg. Detroit Office: 5928 Second Blvd.

DOMESTIC AGENTS: Hallidie Machinery Co., Seattle; Smith, Booth, Usher Co., San Francisco and Los Angeles; Peden Iron & Steel Co., Houston; Fulton Supply Co., Atlanta; F. C. Richmond Machinery Co., Salt Lake City; Siefreat-Elstad Machinery Co., Dayton and Cincinnati; Syracuse Supply Co., Syracuse, Rochester and Buffalo; Hill Clarke Co., Boston.

CANADIAN AGENTS: F. F. Barber Machinery Co., Toronto; Williams & Wilson, Ltd., Montreal.

FOREIGN AGENTS: R. S. Stokvis & Zonen, Rotterdam; R. S. Stokvis & Fils, Paris and Brussels; Anderson, Meyer & Co., Ltd., Shanghai; Andrews & George Company, Ltd., Tokyo; Benson Brothers, Sydney and Melbourne; Burton, Griffiths & Co., Ltd., London; Wilh. Sonnesson & Co., Malmo and Copenhagen; D. Drury & Co., Johannesburg.



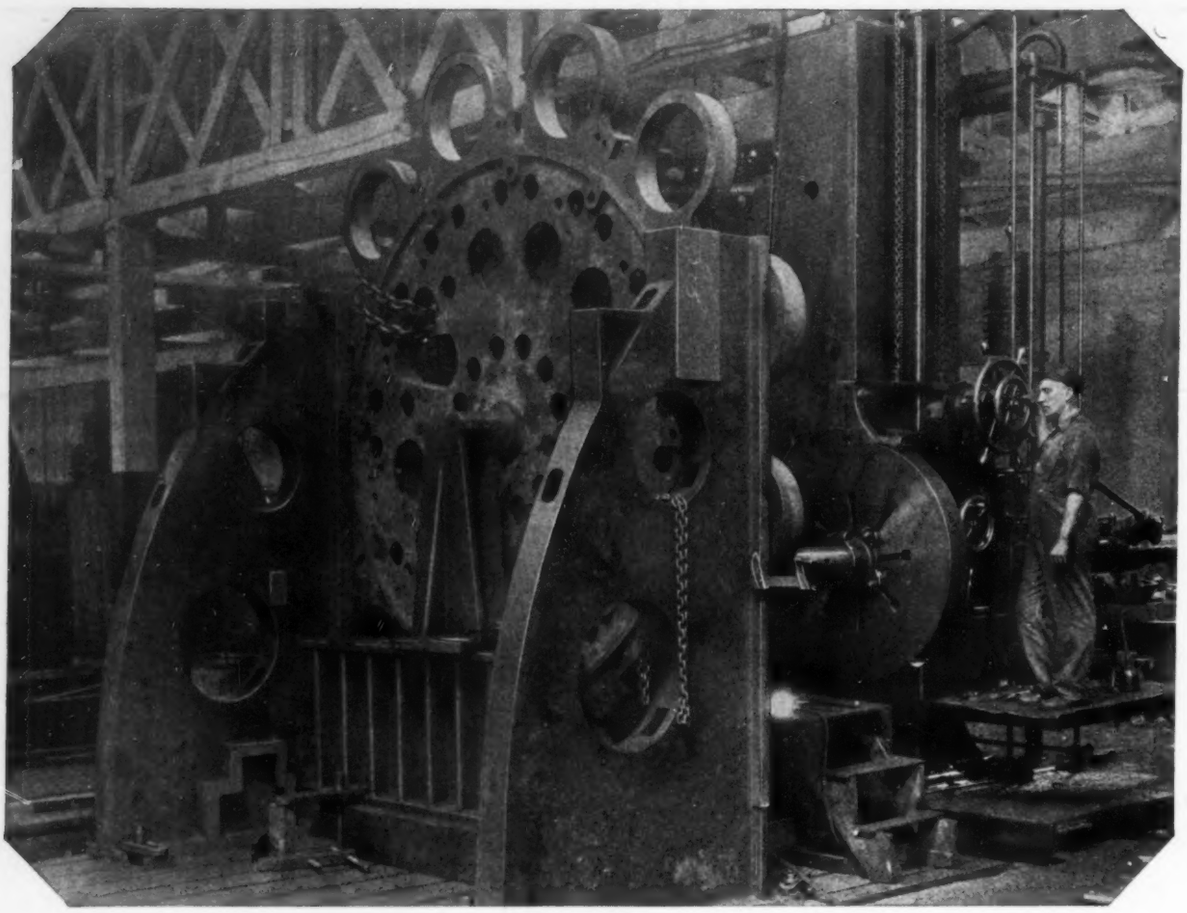
Elevator Parts and Elevator Guides

One of a series of advertisements illustrating the many uses of Union Drawn Steels.

Among our list of customers are found all of the largest users of cold finished steel in the United States

UNION DRAWN STEEL COMPANY

Beaver Falls, Pennsylvania



Can you do *this?*

Can you bore the holes in this casting without a floor borer? Perhaps you have equipment that can be rigged up to do it. Even if you have, could you compete with the floor borer in cost? That is very doubtful if not impossible.

The floor borer finishes all these holes located at different heights and different horizontal positions without moving the heavy, awkward-to-handle piece of work.

Moving and lining up this casting for each hole would take a lot of time and cost a lot of money. With a floor borer, the spindle is raised to the desired height and the column traverses along its base to the correct horizontal location.

No other machine can do such work so economically. And there is a variety of heavy work which a floor borer does well and at an extremely low cost.

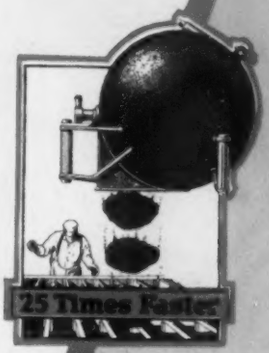
Ask us for details. A Niles sales engineer will be glad to go over your work and tell you whether or not a Niles Floor Borer would save you enough to justify installing it.

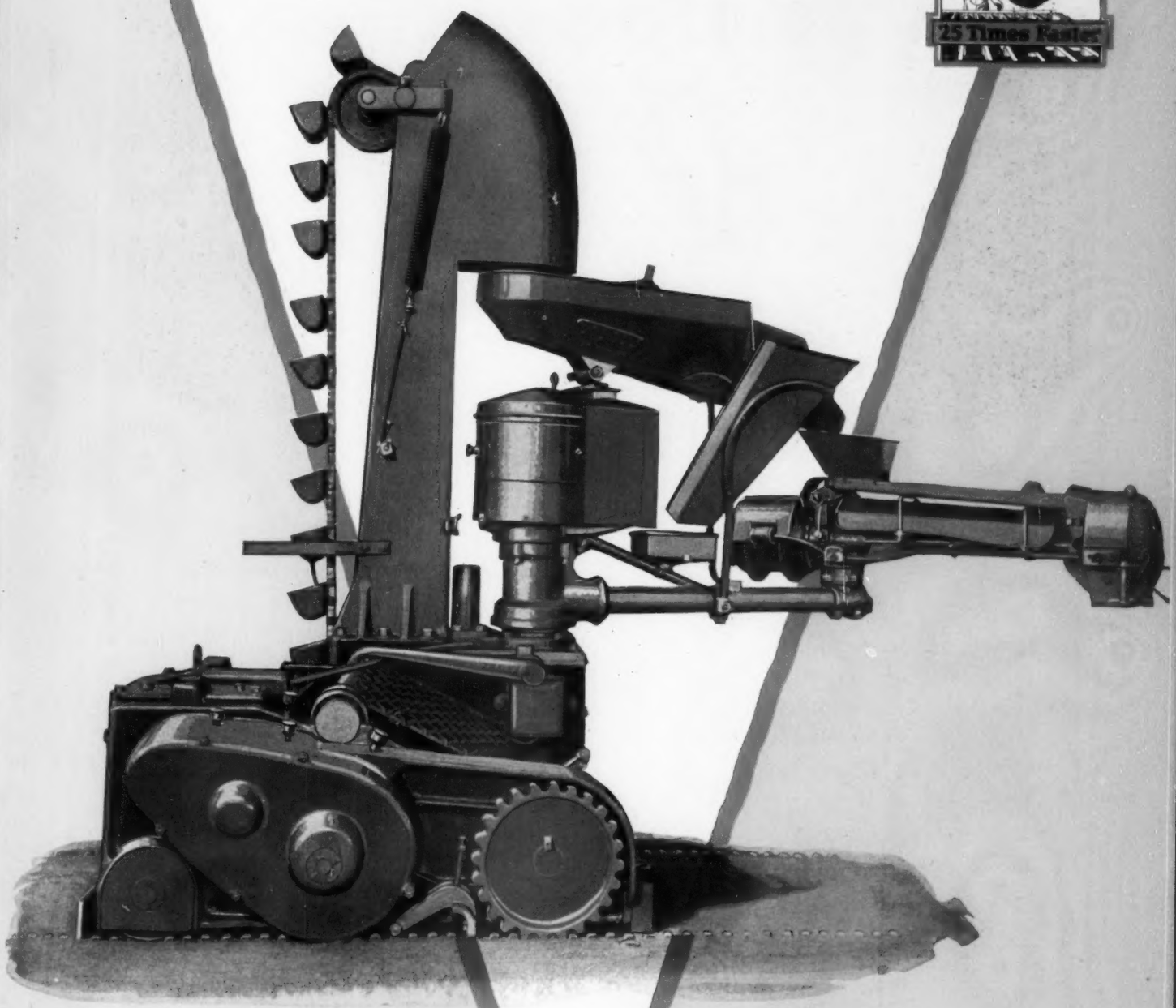
The Niles Tool Works Company

DIVISION NILES-BEMENT-POND COMPANY

Hamilton, Ohio

SANDSLINGERS





OVERHEAD SAND SYSTEMS ARE UNNECESSARY WITH TRACTOR TYPE SANDSLINGERS

Overhead sand systems and elaborate methods of sand cutting are obviously costly of installation – and operation.

The Tractor Type ***Sandslinger*** eliminates overhead sand systems and sand cutting machinery, taking the sand from the floor by means of a right and left screw conveyor, riddling it and delivering it to the ramming head.

Thus they are more than molding machines—they are sand conditioners, sand handlers and sand rammers.

There is no other molding machine, combination of machines, or method, which will produce molds as rapidly and economically as the ***Sandslinger.***

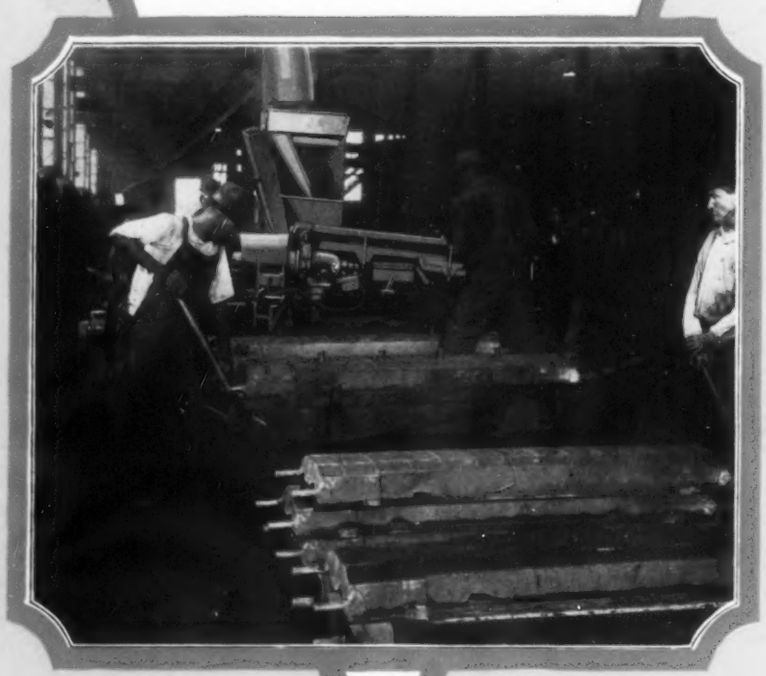
Sound business judgment dictates a change from the antiquated method of yesterday to the rapid, labor saving, profit earning method of today.

Sandslingers are the pace setters for the foundry—Catalog No. 90 pictures and describes all types in operation.

THE BEARDSLEY & PIPER COMPANY

2541 N. Keeler Ave., Chicago, Ill.

Representatives in principal foreign countries



DON'T EXPERIMENT!

ADAMITE IS STILL THE PROVEN ROLL

Like the Brook:—

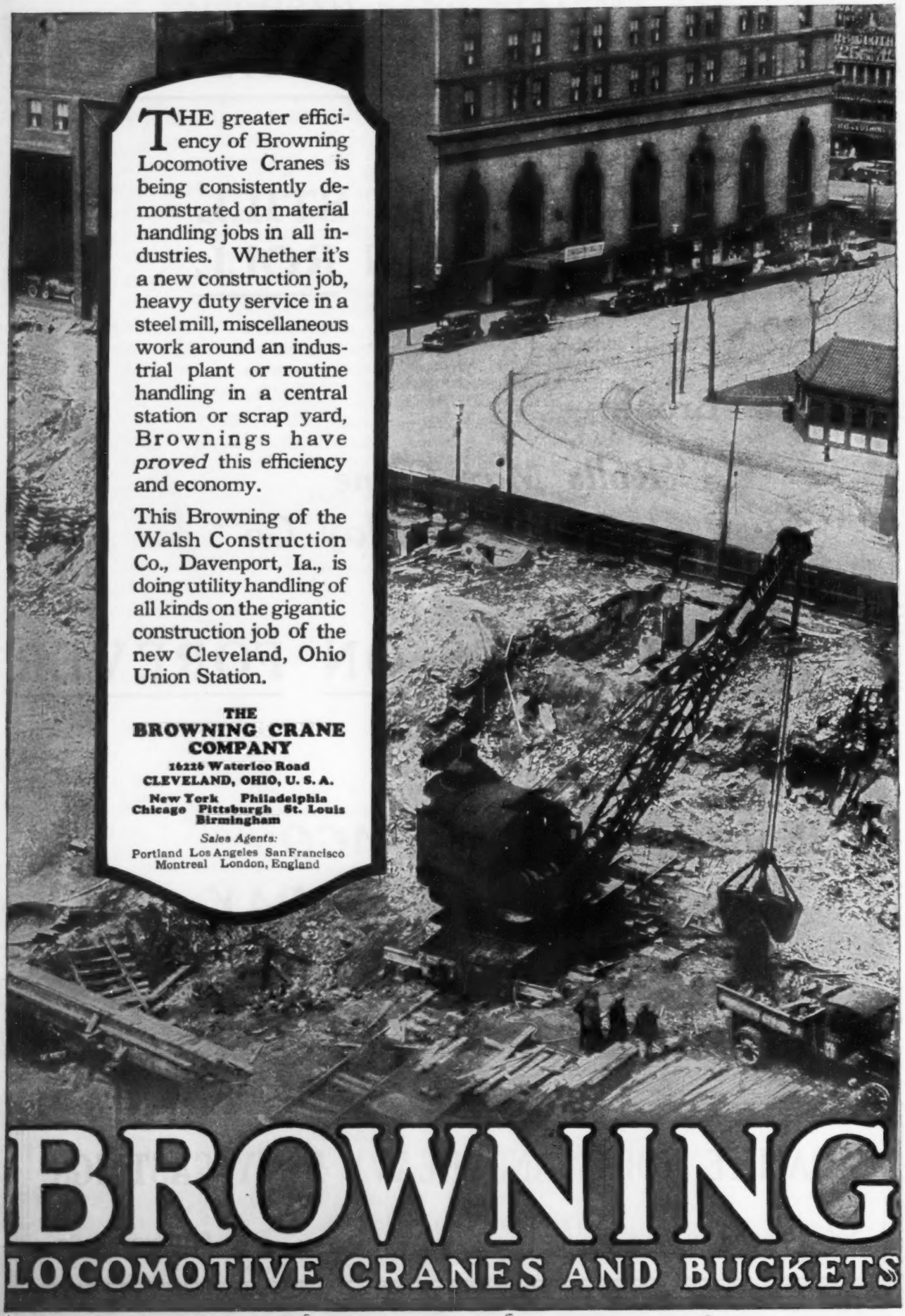
"Rolls May Come
And Rolls May Go"

ADAMITE GOES ON FOREVER

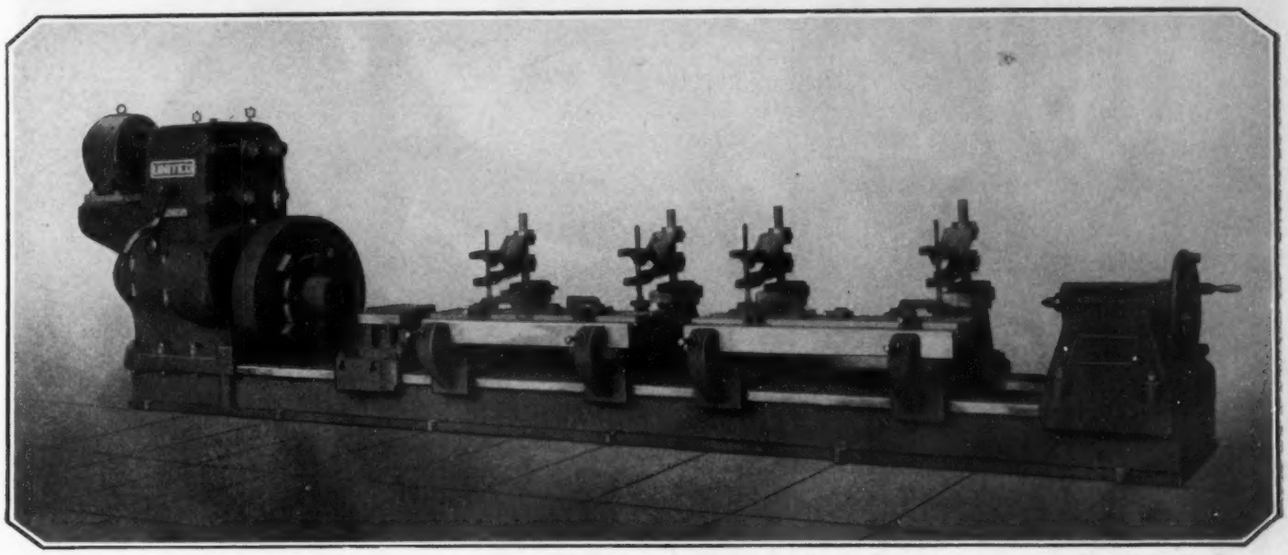
THE LEADER YEARS AGO
THE LEADER TODAY
THE LEADER TOMORROW

ADAMITE ROLLS AND HEAVY DUTY CASTINGS

Sole Manufacturers { Mackintosh-Hemphill Co. / United Engineering & Foundry Co. } *Pittsburgh, Pa.*


THE greater efficiency of Browning Locomotive Cranes is being consistently demonstrated on material handling jobs in all industries. Whether it's a new construction job, heavy duty service in a steel mill, miscellaneous work around an industrial plant or routine handling in a central station or scrap yard, Brownings have *proved* this efficiency and economy.
This Browning of the Walsh Construction Co., Davenport, Ia., is doing utility handling of all kinds on the gigantic construction job of the new Cleveland, Ohio Union Station.
THE BROWNING CRANE COMPANY
16226 Waterloo Road
CLEVELAND, OHIO, U. S. A.
New York Philadelphia Chicago Pittsburgh St. Louis Birmingham
Sales Agents:
Portland Los Angeles San Francisco Montreal London, England
BROWNING
LOCOMOTIVE CRANES AND BUCKETS

"UNITED" HEAVY DUTY ROLL LATHES



18-inch Heavy Duty Change-Gear Type Motor-Driven Roll Lathe Equipped for Turning Two Rolls at a Time.

QUALITY **UNITED** SERVICE
ROLLS
FOR IRON, STEEL AND TUBE WORKS
— *INCLUDING* —
SAND CHILLED
STEEL ADAMITE
UNITED SPECIAL STEEL

UNITED SPECIAL CHILLED
WITH GREEN WABBLERS

UNITED SPECIAL GRAIN
WITH GREEN WABBLERS

One of the pioneers of "Better Rolling Mill Machinery." Installing a Heavy Duty Roll Lathe is a paying investment as it greatly reduces roll turning time.

Why not get them for your roll shop?

UNITED ENGINEERING & FOUNDRY CO.
PITTSBURGH — PENNSYLVANIA

Builders of Complete Machinery Equipment for Iron, Steel & Tube Works

Lad Puts a Punch in this Argument

"Listen Lad—

don't ask me to substitute Stable-Arc welding for riveting on the new machines in order to get better production because in my estimation *strength of joints* is more important right now than faster or cheaper production and . . . "

"Hold, Pop—

you've slipped into reverse gear again. What do you mean . . . STRENGTH?

On those riveted seams you take away better than a third of the metal when you punch the row of rivet holes . . . whereas in Stable-Arc welding you *add* metal.

And how are you going to get 100% strength with one third gone?

By punching more holes and flogging down a lot more rivets?

Certainly *not*—because as your rivet strength goes up, your plate strength goes *down*—and sometimes OUT.

Of course a bevy of rivets makes a joint that LOOKS strong.

But looks and traditional strength don't stand test—ask Dempsey—he knows."

But for real information on arc welding write to Dept. No. 20-12.

A new text book on Arc Welding (Price $1.50) will be sent on approval for five days to any executive requesting it.

Book size, 6" x 9"—Total pages, 160—Number illustrations, 200—Charts, 62—Divisions, 8.

The Lincoln Electric Co., Cleveland, Ohio

WL-1A

"Stable-Arc"

LINCOLN WELDER

TIN MILL BLACK PLATE

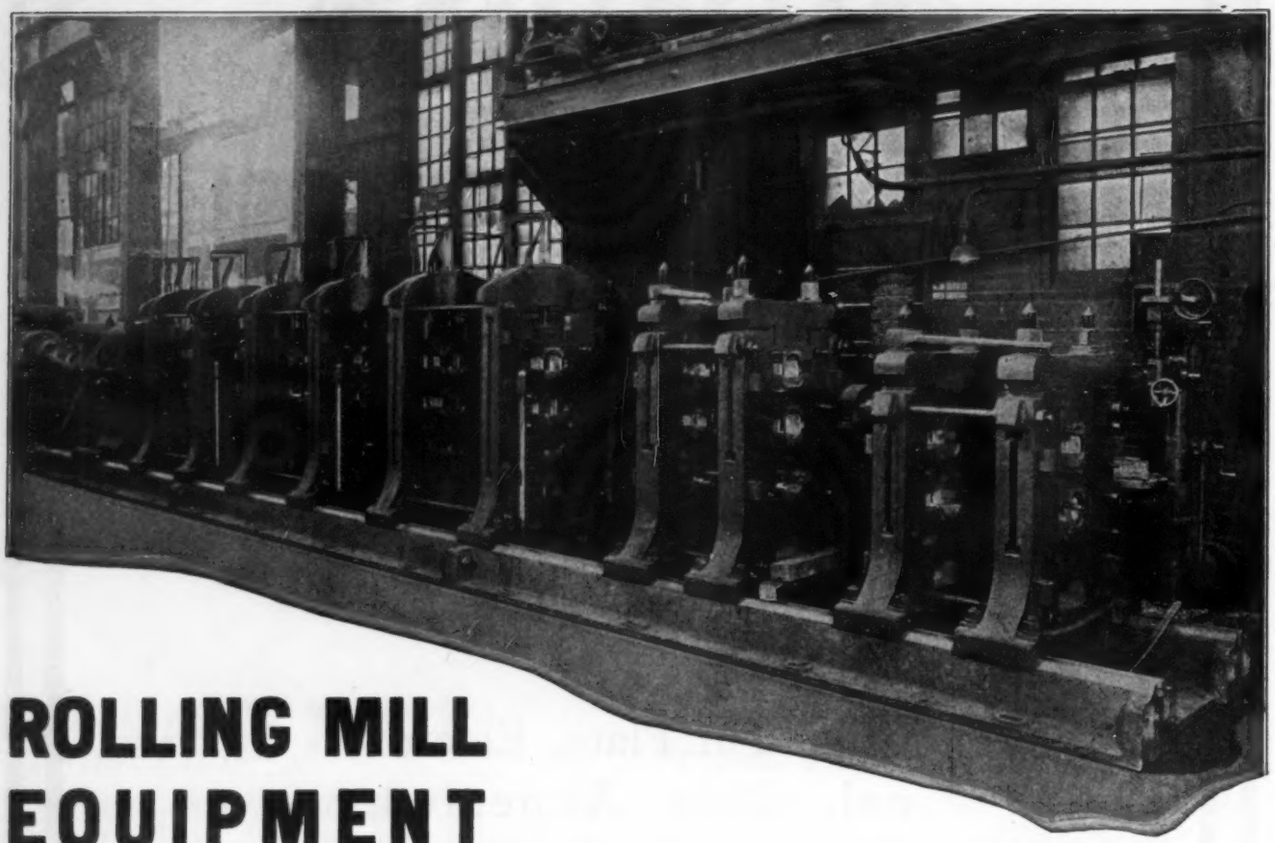
Coke Tin Plate, Electrical, Blue Annealed, Black and Galvanized Sheets, Hot and Cold Rolled Strip, Long and Short Ternes.

The Trumbull Steel Co.

General Offices and Works:
WARREN, OHIO

District Offices:
New York, Chicago, Philadelphia, Cleveland, Detroit, St. Louis, Nashville, Memphis, Dallas, San Francisco, Seattle, Los Angeles, Toronto

WHEELING



ROLLING MILL EQUIPMENT

18" Merchant Mill

Blooming Mills
Structural Mills
Tables
Straighteners
Crop Conveyors
Roll Lathes

WHEELING QUALITY
STEEL ROLLS
SUPER-STEEL ROLLS
CHILLED ROLLS
SAND ROLLS
Mo-lyb-den-um
ROLLS
STEEL AND IRON CASTINGS
ROLLING MILL MACHINERY
SPECIAL MACHINERY

WHEELING MOLD & FOUNDRY CO.
WHEELING, W. VA.

"Granite" Pig Iron

Foundry - Malleable - Basic

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BY-PRODUCT

Foundry - Furnace - Domestic

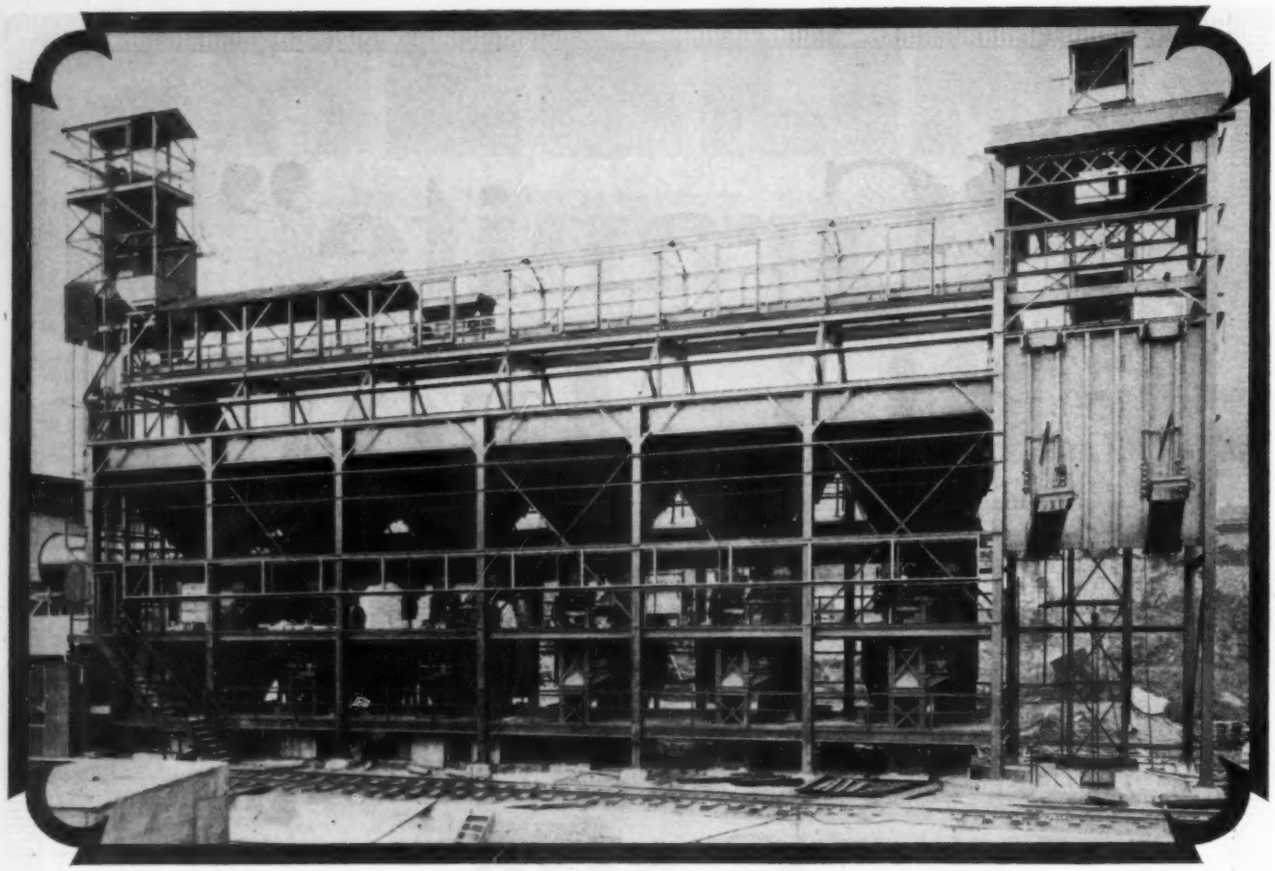
—■—

29 railroads serve our plant, insuring adequate car supply, and prompt service at all times

—■—

St. Louis Coke & Iron Corporation

Chicago **St. Louis**



A recent installation of six W. S. M. Mechanical Gas Producers

W-S-M Type "L" Gas Producers

The result of long experience

We were the pioneer manufacturers of Mechanical Gas Producers—and supplied more than 1100 of the well known Hughes Gas Producer prior to the introduction of the W-S-M Type "L" in 1922.

Since 1922 more than 200 Type "L" Gas Producers have been sold—over 55 of them within the past year. The Type "L" is noted for its increased gas-making capacity, more uniform gas flow, low coal consumption, and steady furnace temperature.

A W-S-M Gas Producer Engineer will gladly call on you at your request. Write!

THE WELLMAN-SEAVER-MORGAN CO.

ENGINEERS CONSTRUCTORS MANUFACTURERS

Cleveland, Ohio

If You Make Any Product of Sheet Steel Have It Listed in This Directory

A directory is being compiled by this Committee which will list products that are made of Sheet Steel and will list the names and addresses of makers of such products under proper classifications and cross-indexes.

When completed this directory will be placed in the hands of buyers for Department Stores, Hardware Stores, Building Supply Dealers and Mercantile Institutions of various kinds.

No Charge for This Service

This directory will be compiled and distributed entirely at the expense of this Committee.

It is important, however, that if the work is to be of the most value to all concerned, its listings should be *complete* and *accurate.*

If you manufacture anything from Sheet Steel and have not already furnished complete information to us regarding it, please let us have such data now.

SHEET STEEL
TRADE EXTENSION COMMITTEE
OLIVER BUILDING
PITTSBURGH PENNSYLVANIA

Valley Mould Keeps Contact With Steel Progress

In the Valley Plant: Core bar with a sand flange to give the mold a sand bottom being set on the ramming base

"Progress" is written in letters of fire in the steel industry. Phenomenal growth of the industry and of individuals has been based on constant improvement in methods and equipments.

Valley Mould has played its part in the dissemination of the means of progress. Our men are constantly meeting situations that involve the newest developments in steel-making. By thus keeping in the van of steel progress, they are in position to apply the composite thought of the steel industry on the mould and ingot problems of Valley customers.

The Valley Mould & Iron Corporation has never been content to merely make moulds. It will continue to keep step with steel progress and to aid whenever possible in producing mould and ingot betterments.

Our engineers will gladly consult with you.

Valley Mould and Iron Corporation

Main Office.....Sharpsville, Pa. **Western Office.....108th St. & Calumet River, So. Chicago, Ill.**

Works {**Sharpsville, Pa.** / **So. Chicago, Ill.**

The Largest Manufacturers of Ingot Moulds in the World

GOOD TUBES

Depend on these Characteristics

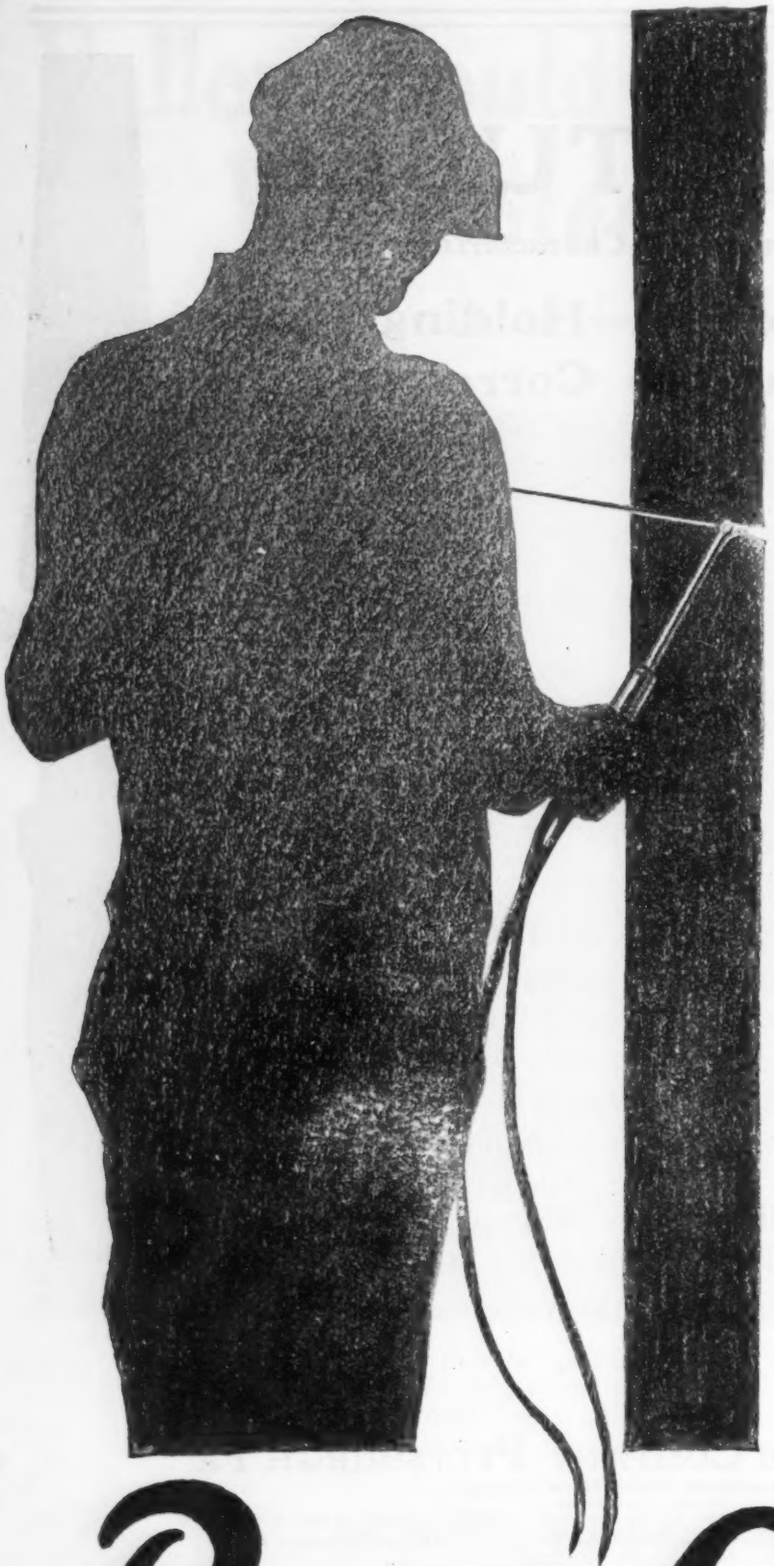
Ductility—Strength—Holding Power
Resistance to Corrosion

"NATIONAL-SHELBY" Boiler Tubes are particularly durable in that sense which includes reliability under severe service conditions. Their strength is more than ample to meet the high pressures of modern service, and they have a holding power which assures a tight tube under the great stresses set up in the boiler. Uniformity of metallic structure and surface finish make these tubes especially resistant to corrosion or pitting, thus insuring long life. Bulletin No. 12 explains how these qualities are built into the tube. A copy mailed upon request.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
GENERAL SALES OFFICES: FRICK BUILDING

DISTRICT SALES OFFICES
Atlanta Boston Chicago Denver Detroit New Orleans New York Salt Lake City Philadelphia Pittsburgh St. Louis St. Paul
Pacific Coast Representatives: U. S. Steel Products Co. San Francisco Los Angeles Portland Seattle
Export Representatives: United States Steel Products Company, 30 Church Street, New York City; 36-38 New Broad Street, London, E. C.

"NATIONAL SHELBY"



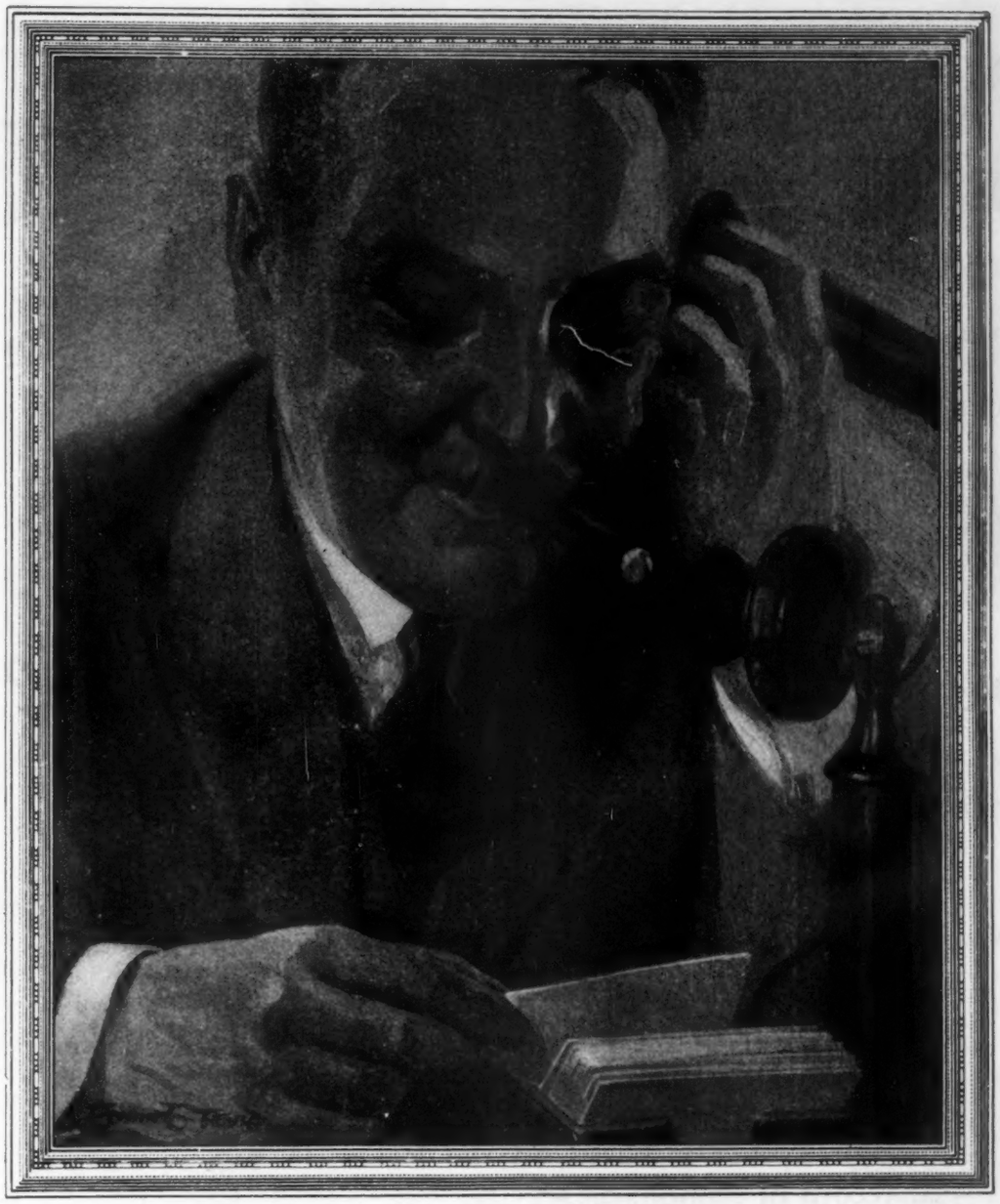
21 years old *but still* Growing

Large volume usually indicates a good product. Certainly this is true of Prest-O-Lite dissolved acetylene which has been used in greater volume year after year for 21 years. Today you can obtain Prest-O-Lite for oxy-acetylene welding and cutting from 116 plants and warehouses.

The PREST-O-LITE COMPANY, Inc.
Oxy-Acetylene Division

General Offices: Carbide and Carbon Building
30 East 42d St., New York
In Canada: Prest-O-Lite Co. of Canada, Ltd., Toronto
31 Plants—85 Warehouses—22 District Sales Offices

Prest-O-Lite
DISSOLVED ACETYLENE



MEN WHO KNOW EMPIRE *New Process* BOLTS

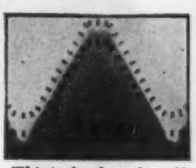
The Purchasing Agent

HERE is old "Concentrated Buying Power" personified. His motto is "The most for the least". It has to be.

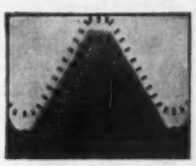
But most of what?

Well, when it comes to bolts, he buys Empire *New Process* Bolts. Not because they are the cheapest nor because they are the most expensive (*I should say not!*), but because they last longer, they always fit, and they save the workman's time.

For they are unbelievably accurate—and uniformly *accurate—and 20% stronger.*



This is the thread profile of a hardened and ground gauge



And here is the thread profile of an average Empire New Process Bolt

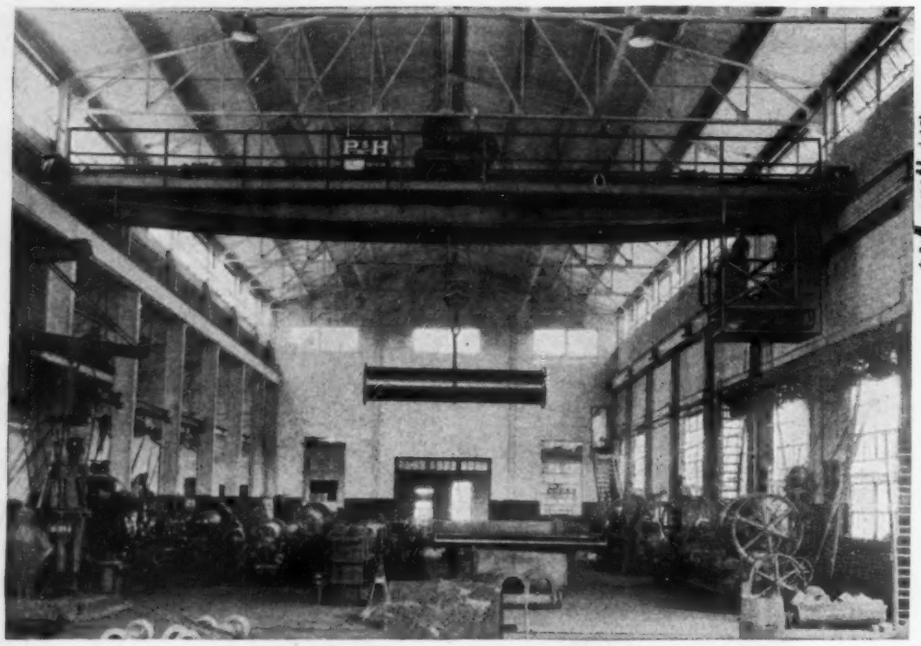
RUSSELL, BURDSALL & WARD BOLT & NUT COMPANY

PORT CHESTER, N.Y.

Branch Office: Straus Building	Branch Office: General Motors Bldg.	Branch Factory:	Strimple & Gillette 169 Jackson Street	Maydwell & Hartzell, Inc. 158-168 Eleventh Street
CHICAGO	DETROIT	ROCK FALLS, Ills.	SEATTLE	SAN FRANCISCO

Makers of Bolts, Nuts and Rivets Since 1835

EMPIRE *New Process* BOLTS



1903

—the year Panama won its independence from Columbia, opening the way for the Panama Canal—saw the first P & H Crane begin its service in the plant of a certain famous machine manufacturer. This firm now uses 56 P & H Cranes—ample proof of thorough satisfaction.*

Why save today at the cost of tomorrow?

Service measures the cost of equipment. That's why dollars saved by short-sighted economy are always eaten up by tomorrow's maintenance expenses.

The only safeguard is looking beyond the price tag.

Buying their first P&H Crane in 1903, a nationally known machine manufacturer of air compressors and machinery* now uses 56. Their preference is based on the P&H 24 year record of economical service.

This, and the many other equally impressive records of P&H Cranes, can prove a money saving guide to you.

**Name of this company given on request*

Money Saving features of P & H Cranes

Accessibility of all parts.
Durability through liberal design.
All gears of steel.
All trolley bearings bronze-bushed.
Through bolts used throughout.
Front lever control—operator has full view of hook in all positions.
All safety requirements met.
Built completely in P&H shops—not merely assembled.

Bulletin No. 408 explains fully the many time saving and service guaranteeing features of P & H Cranes. Write for a copy.

Write for complete information

HARNISCHFEGER CORPORATION
Successor to
PAWLING & HARNISCHFEGER CO.
Established in 1884
3811 National Avenue, Milwaukee, Wis.

BRANCH OFFICES:

New York	Pittsburgh	Philadelphia	Memphis	Detroit	Birmingham	Indianapolis	Los Angeles	Atlanta	Miami
Chicago	Jacksonville	Kansas City	Dallas	Charlotte	Portland	San Francisco	Seattle	Tampa	

P&H CRANES and HOISTS

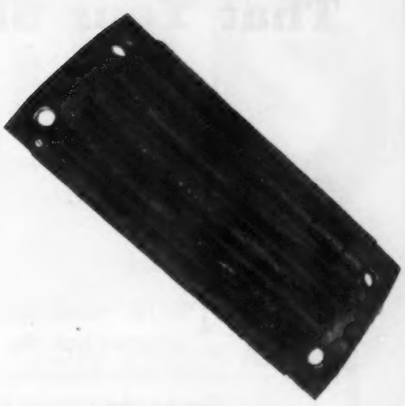
FARRELL'S 85

A Distinct Advantage

"Farrell's 85" contributes maximum strength to equipment and reduces breakages to a minimum thus eliminating costly shutdowns and delays.

When you realize that this material is easily machineable you see why castings of "Farrell's 85" offer distinct advantages to engineers responsible for the operation and maintenance of equipment.

Castings are machined to close limits insuring true mechanical performance and at the same time do not lose their hardness, toughness, and wear resisting qualities.



Write us for quotations and recommendations on different types of castings to which this excellent wear-resisting material is applicable. Any information you may have to offer as to the weights of castings and requirements will be greatly appreciated. Send us your prints or sketches.

The Farrell-Cheek Steel Foundry Co., Sandusky, O.

FARRELL-CHEEK

Courtesy Kaufmann & Fabry Co.

That Your Ship May Come In—Well Laden

One ship sails East, and one sails West,
By the very same winds that blow,
It isn't the gale, but the set of the sail,
That determines the way they go.
— Kipling.

TRUE, each must sail his own course, but the charts and plans of modern business prove good pilots. Today the buying trend of manufacture is toward short time contracts, small orders and quick shipments. Very little capital is being tied up in larger stocks of steel—increased turnover and quick profits are the rule.

To aid in this plan large stocks of iron and steel are maintained in each Ryerson Plant. All material is cut to size and shipped without delay. We trust, this service may help bring in your ship a little sooner and well laden with the things you value most.

JOSEPH T. RYERSON & SON INC.
ESTABLISHED 1842

PLANTS: CHICAGO ST. LOUIS CLEVELAND NEW YORK
MILWAUKEE CINCINNATI DETROIT BUFFALO BOSTON

REPRESENTATION IN: DENVER LOUISVILLE SAN FRANCISCO JERSEY CITY
MINNEAPOLIS TULSA HOUSTON LOS ANGELES NEWARK

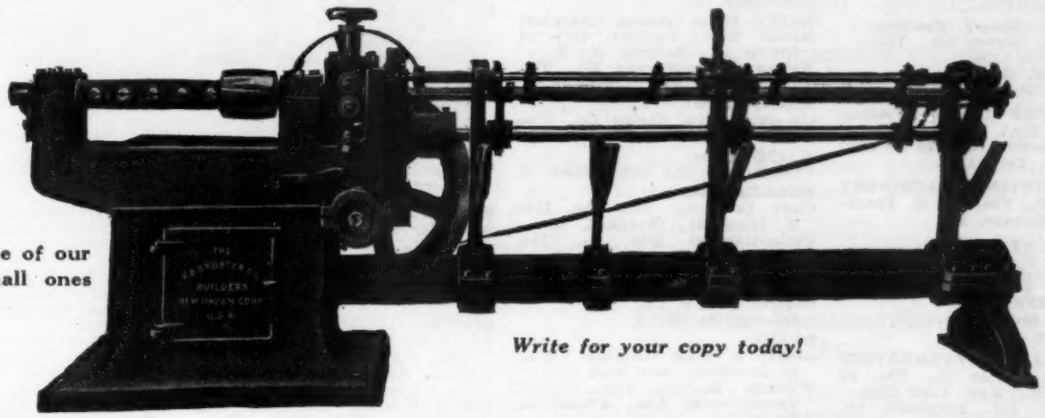
RYERSON STEEL-SERVICE

High Production and Low Cost

It is the aim of all executives. It is made a reality by the performance of

"SHUSTER" Wire Straighteners and Cutters

These machines automatically take any size and any shape of wire direct from the coil and straighten it perfectly, cut it accurately. Their production is enormous, and labor cost is remarkably low. Because of its simplicity of adjustment, one unskilled workman can run a battery of Shusters. Maintenance cost is so low as to be negligible, and they deliver many years of continuous service at top notch efficiency. Many of our machines are still maintaining production schedules after 25 and 30 years of operation. The production figures and photographs of various Shuster installations throughout the country are available in a book which we have prepared for your use.



One of our small ones

Write for your copy today!

The F. B. SHUSTER COMPANY (Established 1866) **New Haven, Conn.**

PITTSBURGH ROLLS CORPORATION

PHOENIX SAND ROLLS

PHOENIX CHILL ROLLS

PHOENIX STEEL ROLLS

PHOENIX METAL ROLLS

Sand - Chilled Steel - Alloy

WHY EXPERIMENT?

USE THE BEST

The National Roll & Foundry Co.

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BLANKS (Ring, Gear and Sprocket)
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Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

BLAST FURNACES—See FURNACES (Blast)

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Ingersoll-Rand Co., 11 Broadway, New York City.
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BLOWERS (Pressure)
Spencer Turbine Co., Hartford, Conn.

BLOWERS (Rotary Positive)
Connersville Blower Co., The, Connersville, Ind.
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BLOW PIPES (Brazing, Welding, Cutting, Etc.)
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Sotter Bros., Inc., Pottstown, Pa.

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Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.

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BOILER TUBES — See TUBES (Boiler)

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National Machinery Co., Tiffin, O.

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Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Lake Erie Bolt & Nut Co., 915 E. 63rd St., Cleveland, O.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

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Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

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Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BOLTS (Machine)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

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Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOLTS (Stove)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

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Penton Publishing Co., Cleveland, O.

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Universal Boring Machine Co., Hudson, Mass.

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Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

BOXES (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BOXES (Tote)
Truscon Steel Co., Youngstown, O.

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Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.
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Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

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Harbison Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Soisson, Jos., Fire Brick Co., Connellsville, Pa.
Stowe-Fuller Refractories Co., 1659 Union Trust Bldg., Cleveland, O.
U. S. Refractories Corp., Mt. Union, Pa.

BRICK INSULATING — See INSULATING BRICK

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Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Eichleay, John, Jr., Co., S. 20th and Wharton, Pittsburgh, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Phoenix Bridge Co., 20 S. 15th St., Philadelphia, Pa.
Steel Plate Products Co., Pottstown, Pa.
Truscon Steel Co., Youngstown, O.

BRONZE (Centrifugally Cast)
Penn Mold & Mfg. Co., Wheeling Trust Bank Bldg., Wheeling, W. Va.

BRONZE (Corrosive Resisting)
Alcumite Corp., The, Dayton, O.
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
Hills-McCanna Co., 2025 Elston Ave., Chicago, Ill.

BRONZE (High Tensile)
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
Hills-McCanna Co., Elston Ave., Chicago, Ill.

BRONZE (Manganese)
American Manganese Bronze Co., Holmesburg Junction, Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

BUCKETS, ELECTRIC (Clam Shell and Grab)
Erie Steel Construction Co., Erie, Pa.

BUCKETS (Clam Shell)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E., 223 Fourth Ave., Pittsburgh, Pa.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Erie Steel Construction Co., Erie, Pa.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.
Williams, G. H., Co., 611 Hayburger Lane, Erie, Pa.

BUCKETS (Clam Shell, Orange Peel, Drag Line, Grab)
McMyler-Interstate Co., Bedford, O.

BUCKETS (Dumping)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

BUCKETS (Grab)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E., 223 Fourth Ave., Pittsburgh, Pa.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Erie Steel Construction Co., Erie, Pa.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.
Williams, G. H., Co., 611 Hayburger Lane, Erie, Pa.

BUILDINGS (Steel)—See BRIDGES, BUILDINGS and VIADUCTS, STACKS (Steel)

BULLDOZERS
Beatty Machine & Mfg. Co., Hammond, Ind.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.

BURNERS (Acetylene)—See TORCHES AND BLOWERS (Acetylene, Blow, Oxyacetylene)

BURNERS (Fuel, Oil, Gas and Combination)
Strong, Carlisle & Hammond Co., The, 826 Frankfort Ave., Cleveland, O.

BURNERS (Oil)
Best, W. N., Corp., 11 Broadway, New York City.
Hauck Mfg. Co., 114 Tenth St., Brooklyn, N. Y.

BY-PRODUCT PLANTS
Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

CAN MAKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.

CARBON BURNING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

CAR DUMPERS (Coal, Ore and Ash Handling Machinery)
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
McMyler-Interstate Co., The, Bedford, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

CASTINGS (Acid Resisting)
Alcumite Corp., The, Dayton, O.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Chicago Steel Foundry Co., Kedzie Ave. and 37th St., Chicago, Ill.
Cincinnati Steel Castings Co., The, Queen City & Spring Grove Aves., Cincinnati, O.
Electro-Alloys Co., The, Elyria, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co., Toledo, O.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Sivyer Steel Casting Co., Milwaukee, Wis.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.

CASTINGS (Bessemer Iron)
Valley Mould & Iron Corp., Sharpsville, Pa.

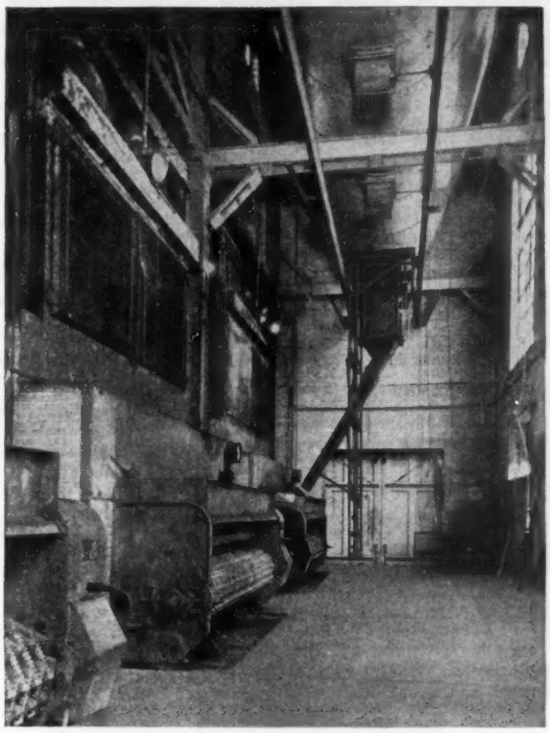
CASTINGS (Brass, Bronze, Copper, Aluminum)
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Enterprise Brass Works, Muskegon, Mich.
Hills-McCanna Co., 2025 Elston Ave., Chicago, Ill.
Keystone Bronze Co., 39th St., Pittsburgh, Pa.
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.
Metal & Alloy Specialties Co., Inc., 1870 Elmwood Ave., Buffalo, N. Y.

CASTINGS (Chemical and Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

CASTINGS (Electric Steel)
Chicago Steel Foundry Co., Kedzie Ave. & 37th St., Chicago, Ill.
Cincinnati Steel Castings Co., The, Queen City & Spring Grove Aves., Cincinnati, O.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co., Toledo, O.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Cascade Foundry Co., 19th & Plum Sts., Erie, Pa.
Cyclops Foundry Co., 1503 Union Bank Bldg., Pittsburgh, Pa.
Forest City Foundry & Manufacturing Co., The, 1220 Main St., Cleveland, O.
Lake Shore Engine Works, Marquette, Mich.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadedphia, Pa.
Monessen Foundry & Machine Co., Monessen, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above



Webster traveling weigh larry distributing coal to stokers in a power plant

The proper method and the proper equipment

The right method of doing your specific material handling job and the right equipment with which to do it can both be supplied by The Webster Mfg. Company.

With fifty years' experience in solving the material handling problems of America's industries and with unlimited facilities for building the necessary equipment, Webster is looked upon as headquarters for material handling machinery.

Webster designs and builds mechanical handling equipment for power plants, cement mills, chemical plants, coal tipples, locomotive coaling stations, foundries, steel plants and countless other industries handling materials in bulk or package.

Upon request and without obligation to you, Webster engineers will study your requirements and make recommendations.

The Webster Mfg. Company
4500-4560 Cortland Street
CHICAGO

WEBSTER-BRINKLEY CO., SEATTLE, WASH.
WEBSTER-INGLIS Ltd., TORONTO, ONT.
BOSTON BUFFALO CINCINNATI CLEVELAND NEW YORK PHILADELPHIA PITTSBURGH

Speed Up with a Boyer Superior Sand Rammer

Boyer Superior Type "A" Sand Rammer ramming large casting at the Franklin Foundry Co., Franklin, Pa.

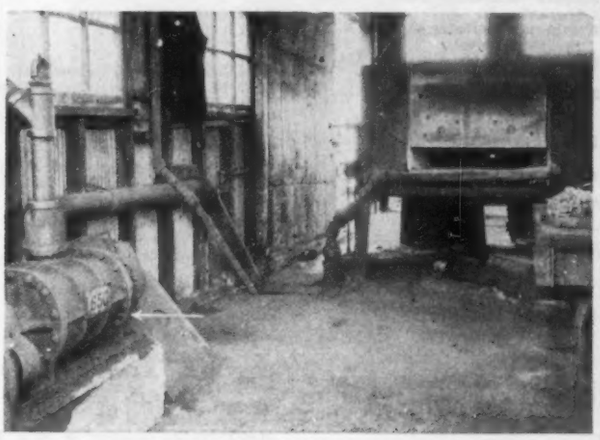
THE Boyer Superior Type "A" Sand Rammer has been designed for the heavier classes of work in steel and iron foundries.

Many special features have been incorporated in the design of this rammer. A radial exhaust deflector protects the operator by deflecting the exhaust air downward. The back-head is secured to the cylinder by a simple positive locking device of the pin type. A portion of the exhaust air is carried down through air passages, and effectively carries away the sand which the felt washer has removed from the piston.

Let us demonstrate the ability of this rammer to speed up your work and reduce your costs.

P-274-S

Chicago Pneumatic Tool Co.
Sales and Service Branches all over the World
6 East 44th Street New York



ROOTS "Acme" Blowers are made in sizes up to 400 c.f.m. and operate at pressures up to 6 lbs. per sq. in.

There are one or more places in your plant where you can use a Roots "Acme" to advantage. Their easy application and trouble free operation recommend them for any use that requires dependable service. Ask for Bulletin "B-23."

The P.H.&F.M. ROOTS CO.
CONNERSVILLE, IND.

ROOTS ACME BLOWERS AND GAS PUMPS

CHICAGO Peoples Gas Bldg.
NEW YORK 120 Liberty St.

Representatives in Principal Cities

CASTINGS (Gray Iron) Cont.
National Roll & Foundry Co., The, Avonmore, Pa.
Ottumwa Iron Works, Ottumwa, Iowa.
Standard Engineering Co., Ellwood City, Pa.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Walworth Run Foundry Co., The, W. 27th & Nickel Plate R. R., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CASTINGS (Heat Resistant)
Electro-Alloys Co., The, Elyria, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.

CASTINGS (Malleable)
American Malleable Castings Association, Union Trust Bldg., Cleveland, O.
Columbus Malleable Iron Co., Columbus, O.
Danville Mealleable Iron Co., Danville, Ill.
Haven Malleable Castings Co., The, Knowlton St., Cincinnati, O.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Iowa Malleable Iron Co., Fairfield, Iowa.
Kalamazoo Malleable Iron Co., Kalamazoo, Mich.
Lakeside Malleable Castings Co., Racine, Wis.
Link-Belt Co., P. O. Box 846, Indianapolis, Ind.
Marion Malleable Iron Works, Marion, Ind.
Meeker Foundry Co., Clay & Ogden Sts., Newark, N. J.
Midwest Casting Co., Middletown, Ohio.
Moline Malleable Iron Co., St. Charles, Ill.
Newark Malleable Iron Works, Newark, N. J.
Northern Malleable Iron Co., St. Paul, Minn.
Peoria Malleable Castings Co., Peoria, Ill.
Pittsburgh Malleable Iron Co., 34th & Smallman Sts., Pittsburgh, Pa.
Rockford Malleable Iron Works, Rockford, Ill.
Ross-Meehan Foundries, Chattanooga, Tenn.
Temple Malleable Iron & Steel Co., Harrison Bldg., Philadelphia, Pa.
Vermillion Malleable Iron Co., Hoopeston, Ill.
Wisconsin Malleable Iron Co., Milwaukee, Wis.
Zanesville Malleable Co., Zanesville, O.

CASTINGS (Manganese Steel)
Morrison, J. S., Co., Inc., 528 Oliver Bldg., Pittsburgh, Pa.

CASTINGS (Monel Metal)
Pittsburgh Valve, Foundry & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.

CASTINGS (Nickel Chromium)
Chicago Steel Foundry Co., Kedzie Ave. at 87th St., Chicago, Ill.

CASTINGS (Semisteel)
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

CASTINGS (Steel)
Allegheny Steel Co., Brackenridge, Pa.
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Atlas Steel Casting Co., 1963 Elmwood Ave., Buffalo, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Chicago Steel Foundry Co., Kedzie Ave. at 87th St., Chicago, Ill.
Columbia Steel Corp., Balfour Bldg., San Francisco, Calif.
Commercial Steel Castings Co., The, Marion, O.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland, O.
Era Steel Co., The, Bucyrus, Ohio.
Farrell-Cheek Steel Foundry Co., Sandusky, Ohio.
Federal Steel Foundry Co., Chester, Pa.
Industrial Steel Casting Co., Toledo, O.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Mesta Machine Co., Homestead, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Reliance Steel Casting Co., 28th and Smallman Sts., Pittsburgh, Pa.
Ross-Meehan Foundries, Chattanooga, Tenn.
Sharon Foundry Co., Sharon, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CASTORS (Plate Mill)—See PLATE CASTORS

CEMENT (High Temperature)
Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia, Pa.
Harbison Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

CEMENT (Silica and Chrome)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

CEMENT MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CENTRAL STATION EQUIPMENT
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., E. Pittsburgh, Pa.

CHAIN DRIVES
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

CHAINS (Crane & Hoist)
American Chain Co., Bridgeport, Conn.
Carroll Chain Co., The, 265 Hosack St., Columbus, O.

CHAINS FOR ALL PURPOSES
American Chain Co., Bridgeport, Conn.
Carroll Chain Co., The, 265 Hosack St., Columbus, O.

CHAINS (Power Transmission)
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

CHAINS (Sling)
Carroll Chain Co., The, 265 Hosack St., Columbus, O.

CHANNELS—See STEEL (Structural)

CHAPLETS
Erdle Perforating Co., 171 York St., Rochester, N. Y.

CHARCOAL
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.

CHARGING MACHINES (Cupola)
Roots, P. H. & F. M., Co., Connersville, Ind.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CHEMICALS
American Chemical Paint Co., Ambler, Pa.
Ford, J. B., Co., The, Wyandotte, Mich.

CHISEL BLANKS
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell St., Chicago, Ill.

CHROME ORE
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

CHROME PLATING
Chromium Corp. of America, 26 Broadway, New York City.

CHROME VANADIUM
Allen, Edgar, Steel Co., Inc., 718-722 W. Lake St., Chicago, Ill.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

CHUCKS (Lathe)
Whiton, D. E., Machine Co., New London, Conn.

CLEANERS (Metal)—See METAL CLEANERS

CLEANING SPECIALTIES
American Chemical Paint Co., Ambler, Pa.
Ford, J. B., Co., The, Wyandotte, Mich.

CLIPS (Wire Rope)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.

CLUTCH CONES
Transue & Williams Steel Forging Corp., Alliance, Ohio.

CLUTCHES
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

CLUTCHES (Cut-Off Coupling)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES (Friction)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.

COAL AND COKE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Eaton, Rhodes & Co., First National Bank Bldg., Cincinnati, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Park & Williams, Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Pilling & Co., Inc., 1500 Chestnut St., Philadelphia, Pa.
Pittsburgh Coal Co., Oliver Bldg., Pittsburgh, Pa.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
St. Louis Coke & Iron Co., 208 S. LaSalle St., Chicago, Ill.
Snyder, W. P., Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.

COAL CRUSHERS AND PULVERIZERS
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

COAL, ORE and ASH HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Link-Belt 910 So. Michigan Ave., Chicago, Ill.
Orton Crane & Shovel Co., 608 So. Dearborn St., Chicago, Ill.
Webster Mfg. Co., 4500 Cortland St., Chicago, Ill.

COKE—See COAL AND COKE

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

COKE OVENS
Foundation Oven Corp., 120 Liberty St., New York City

COKE OVENS (By-Product)
Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.
Spencer Turbine Co., Hartford, Conn.
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

COMPRESSORS (Portable)
Ingersoll-Rand Co., 11 Broadway, New York City.

CONCRETE ARMORING (Surface)
Irving Iron Works, Long Island City, N. Y.

CONCRETE MIXERS—See MIXERS (Concrete)

CONCRETE REINFORCING BARS—See BARS (Concrete Reinforcing)

CONCRETE WATERPROOFING
Celite Products Co., 1320 S. Hope St., Los Angeles, Cal.

CONDENSERS (Surface, Barometric, Multi-Jet)
Ingersoll-Rand Co., 11 Broadway, New York City.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, O.

CONNECTING RODS
Transue & Williams Steel Forging Corp., Alliance, Ohio.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTROLLERS (Electric)
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Cutler-Hammer Mfg. Co., The Milwaukee, Wis.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.

CONVEYORS (Belt)
Webster Mfg. Co., The, 4500 Cortland St., Chicago, Ill.

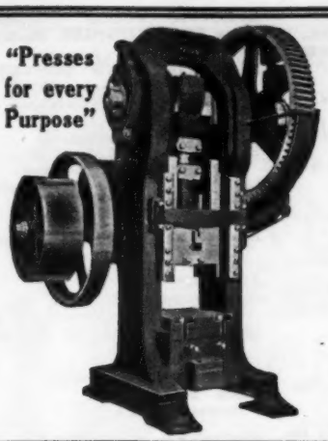
CONVEYORS (Elevating and Conveying)
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

CONVEYORS (Portable)
Mackintosh Engineering Co., Schofield Bldg., Cleveland, O.

COOLERS (Copper)
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below

"Presses for every Purpose"



The "TOLEDO" PRESSES

Cut the cost by producing, in the shortest time, a maximum amount of quality work.

The rigid, powerful *Straight Sided* presses have capacity for the heaviest classes of deep drawing, reducing and forming operations; for punching, piercing, stamping, etc., as well as for trimming drop forgings either hot or cold.

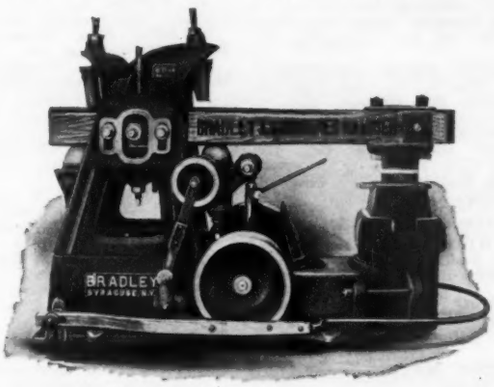
THE TOLEDO MACHINE & TOOL CO., Toledo, Ohio

Engineers, Founders and Machinists on Equipment for Sheet Metal Products.

Chicago Office: 549 West Washington Blvd.

Detroit Office: Room 3—250 General Motors Bldg.

BRADLEY HAMMERS



"Hammer-in" Strength and durability. There never will be a casting made which will equal in strength, durability and general reliability, a forging. Forging produces in the metal a quality of texture which cannot be produced by any other method.

BRADLEY HAMMERS

are pounding strength and durability into many of the world's most famous products.

Why not set them to work for you? Made in 4 Styles and 32 Sizes. Let us send you detailed description

C. C. BRADLEY & SONS, INC.

SYRACUSE, N. Y.

TAYLOR-WILSON Tube Cutting-Off Machine

with Air Operated Chuck and Adjustable Carriage

For fast, clean pipe cutting you cannot do better than install Taylor-Wilson Cutting-Off Machines. Futhermore, they are easily operated and give long service. Ask the user.

We shall gladly send full details. Write!

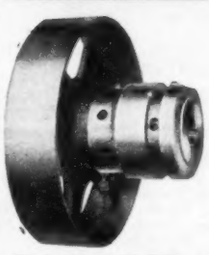
2" to 6" Capacity

TAYLOR-WILSON MFG. CO

ENGINEERS—FOUNDERS—MACHINISTS

MAIN OFFICE AND WORKS McKEES ROCKS, PA.

THE JOHNSON FRICTION CLUTCH



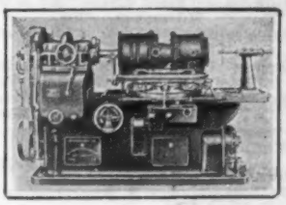
Single Clutch with Pulley

as used on the new

Model F-G Micro Railroad Grinder

This JOHNSON-equipped Micro Railroad Grinder shown here is used very extensively in railroad shops and railway equipment plants. The No. 2 and No. 5 JOHNSON Single Clutches are installed on this machine. JOHNSON Clutches are used widely on all kinds of heavy-duty grinders, milling machines, boring mills, etc. Tremendous power. Amazing resistance. Equip with JOHNSONS.

Write for White Catalog



COURTESY: The Micro Machine Co., Bettendorf, Iowa.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

COOLING BEDS
Morgan Construction Co., Worcester, Mass.

COPPER
Copper & Brass Research Ass'n., 25 Broadway, New York City.

COPPER AND BRASS DRAWING MACHINERY
Vaughn Machinery Co., The, Cuyahoga Falls, O.

CORE MAKING MACHINES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.

CORE OVENS
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.

COTTER PINS
Hindley Mfg. Co., John St., Valley Falls, R. I.

COTTERS
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

COUNTING MACHINES
Veeder Mfg. Co., Hartford, Conn.

COUPLINGS (Carriage)
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y

COUPLINGS (Flexible)
Clark Controller Co, The, 1146 E. 152nd St., Cleveland, O.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.
Farrel Foundry & Machine Co., Buffalo, N. Y.
James, D. O., Mfg. Co., 1120 W. Monroe St., Chicago, Ill.

CRANES
Bedford Foundry & Machine Co., Bedford, Ind.
Cyclops Iron Works, 837 Folsom St., San Francisco, Calif.
Payne, N. B., & Co., 25 Church St., New York City.
Whiting Corp., Harvey, Ill

CRANES (Charging)
Alliance Machine Co., The, Alliance, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

CRANES (Crawling, Tractor, Erection)
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
McMyler Interstate Co., Bedford, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

CRANES (Electric, Industrial, Truck Mounted)
Baker-Raulang Co., The, 2180 W. 25th St., Cleveland. O.

CRANES (Electric Traveling)
Alliance Machine Co., The, Alliance, O.
Box Crane & Hoist Corp., Janney and E. Ontario Sts., Philadelphia, Pa.
Cleveland Crane Engr. Co., The, Wickliffe, O.
Erie Steel Construction Co., The, Erie, Pa.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Milwaukee Elec. Crane & Mfg. Corp., Milwaukee, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES (Gantry)
Bedford Foundry & Machine Co., Bedford, Ind.
Cleveland Crane & Engineering Co., The, Wickliffe, Ohio.
Erie Steel Construction Co., Erie, Pa.
Whiting Corp., Harvey, Ill.

CRANES (Hand)
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.
Whiting Corp., Harvey, Ill.

CRANES (Hydraulic)
Alliance Machine Co., The, Alliance, O.

CRANES (Jib)
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANES Locomotive)
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
McMyler Interstate Co., Bedford, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

CRANES (Motor Truck)
Browning Crane Co., 162nd and Waterloo Rd., Cleveland, O.

CRANES (Portable)
Beatty Machine & Mfg. Co., Hammond, Ind.

CRANES (Wall)
Milwaukee Electric Crane & Mfg. Corp., Milwaukee, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANK SHAFTS
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Transue & Williams Steel Forging Corp., Alliance, O.

CRIMPING MACHINES
Streine Tool & Mfg. Co., The, New Bremen, O.

CRUSHING, GRINDING AND PULVERIZING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CUPRO-VANADIUM
Vanadium Corp. of America, 120 Broadway, New York City.

CUTTING AND WELDING APPARATUS—See WELDING AND CUTTING APPARATUS (Electric)

CUTTING AND WELDING (Oxy-Acetylene Process)—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

CYLINDERS (Acetylene) — See ACETYLENE IN CYLINDERS

CYLINDERS (Oxygen) — See OXYGEN IN CYLINDERS

CYLINDERS (Pressure)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

DECARBONIZING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

DERRICKS
American Terry Derrick Co., So. Kearney, N. J.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Forge & Knife Co., Arsenal Station, Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.
Union Electric Steel Corp., Frick Bldg., Pittsburgh, Pa.

DIE HEADS (Automatic)
Landis Machine Co., Waynesboro, Pa.

DIE HEADS (Self-Opening)
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

DIE MAKERS SUPPLIES
Danly Machine Specialties, Inc., 4915 N. Lincoln Ave., Chicago, Ill.

DIE SETS
Danly Machine Specialties, Inc., 4915 N. Lincoln Ave., Chicago, Ill.
U. S. Tool Co., Inc., Ampere, N. J.

DIE SHOES
U. S. Tool Co., Inc., Ampere, N. J.

DIES
Bethlehem Steel Co., Bethlehem, Pa.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Toledo Machine & Tool Co., Toledo, O.
Vanadium Corp. of America, 120 Broadway, New York City.

DIES (Riveters)
Marchant, George F., Co., 1434 So. Rockwell St., Chicago, Ill.

DOORS (Sidewalk)
Potts Manufacturing Co., New York City.

DOORS AND SHUTTERS (Steel, Fire and Rolling)
Kinnear Mfg. Co., 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

DRAFTING ROOM EQUIPMENT
Pease, The C. F., Co., 853 N. Franklin St., Chicago, Ill.

DRAW BENCHES
Standard Engineering Co., Ellwood City, Pa.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

DRAWING INSTRUMENTS AND DRAWING MATERIALS
Pease, The C. F., Co., 853 N. Franklin St., Chicago, Ill.

DRILLING MACHINES (Automatic)
Barnes Drill Co., Rockford, Ill.

DRILLING MACHINES (Vertical and Gang)
Barnes Drill Co., Rockford, Ill.

DRILLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRILLS (Rock)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRIVES (Cut Herringbone Gears)
Farrel Foundry & Machine Co., Buffalo, N. Y.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., 12th and Etna Sts., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

DRIVES (Gear, Rope)
Mesta Machine Co., Homestead, Pa.

DRYERS (Sand, Coal, Ores, Chemical, Etc.)
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.

DUST ARRESTERS
Mott Sand Blast Mfg. Co., 4611-4621 Flournoy St., Chicago, Ill.
Pangborn Corp., P. O. Box 858, Hagerstown, Md.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Clark Controller Co., The, 1146 E. 152nd St., Cleveland, O.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland O.
General Electric Co., Schenectady, N. Y.

ELECTRIC HEATING APPARATUS
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

ELECTRIC TOOLS (Portable)—See TOOLS (Portable Electric)

ELEVATING AND CONVEYING MACHINERY—See CONEYORS (Elevating and Conveying)

ELEVATORS (Bucket)
Bartlett, C. O., & Snow Co., 6203 Harvard Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

ENGINE LATHES—See LATHES (Engine)

ENGINES (Gas, Oil)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway. New York City.

ENGINES (Heavy Duty)
Mesta Machine Co., Homestead, Pa.

ENGINEER (Galvanizing)
Spowers, Wm. H., Jr., 50 Church St., New York City

ENGINEERS AND CONTRACTORS
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Chapman Engineering Co., Mt. Vernon, O.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Freyn Engineering Co., 310 So. Michigan Ave., Chicago, Ill.
Industrial Maintenance Bureau, 331 Fourth Ave., Pittsburgh, Pa.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
Laughlin, Alex, & Co., First National Bank Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2423 Euclid Ave., Cleveland, O.
Moore, W. E., & Co., Union Bank Bldg., Pittsburgh, Pa.
Phoenix Bridge Co., 20 South 15th St., Philadelphia, Pa.
Pittsburgh Valve, Fdry. & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.
Smythe, S. R., Co., The, House Bldg., Pittsburgh, Pa.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.
Swindell, Wm., & Bros., P. O. Box 1753, Pittsburgh, Pa.

ENGINEERS (Consulting)
American Heat Economy Bureau, 926 Wabash Bldg., Pittsburgh, Pa.
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Ellis, Frank I., 2127 Farmers Bank Bldg., Pittsburgh, Pa.
Freyn Engineering Co., 310 So. Michigan Ave., Chicago, Ill.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2423 Euclid Ave., Cleveland, O.
Monroe, W. K., Co., 1836 Euclid Ave., Cleveland, O.
Moore, W. E., & Co., Union Bank Bldg., Pittsburgh, Pa.
Perin & Marshall, 40 West 40th St., New York City.
Shover, Barton R., 424 Oliver Bldg., Pittsburgh, Pa.

ENGINEERS, CONSULTING (By-Product Coke Oven and Gas Plants)
Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

EXHAUST FANS (Acid Resisting)
Duriron Co., Inc., The, Dayton, O.

EXHAUSTERS (Gas)—See GAS EXHAUSTERS

FACTORY EQUIPMENT (Steel)—See STOOLS AND FACTORY EQUIPMENT (Steel)

FACTORY SPECIALISTS
Fantus Factory Locating Service, 1325 S. Oakley St., Chicago, Ill.
Houston, David, Bond & Co., Inc., Military Park Bldg., 60 Park Place, Newark, N. J.
Technical Service Co., 233 Broadway, New York City.

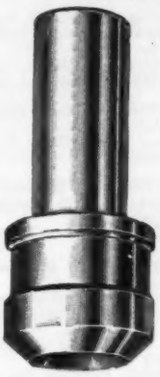
FENCES—See WIRE FENCES

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below

12 Years of Satisfactory Service

covering all classes of riveting is behind our

"VANADIUM"
AIR HAMMER
RIVET SETS



Our success is due to the policy of manufacturing only on the *quality basis*. An unusually high grade of alloy steel is combined with long experience and careful workmanship. Shipped on approval.

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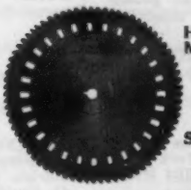
Pneumatic Hammer Rivet Sets and Chisel Blanks
Hardened Steel Specialties
Also
High Speed Circular Metal Cut-off Sawing Machines



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BOLT, NUT, FORGING and WIRE NAIL MACHINERY
"National" Wedge Grip Bolt and Rivet Headers, Nations Bolt Cutter, National Heavy-Pattern Forging Machines etc.
We solicit your inquiries
THE NATIONAL MACHINERY COMPANY
TIFFIN, OHIO, U. S. A.

BIRDSBORO
STEEL FOUNDRY AND MACHINE COMPANY
BIRDSBORO, PENNSYLVANIA
DESIGNERS AND BUILDERS of hydraulic presses and equipment for boiler, structural and railroad shops, shipyards, rubber mills, linoleum plants, asbestos mills and other industries requiring hydraulic equipment. Hydraulic Operating Valves. Special Machinery. Rolling Mills. Rolling Mill Machinery. Steel and Iron Castings. Rolls: "Durite". Steel Chilled and Sand. Railroad Castings. Bolsters. Side Frames. Forging Ingots. Crushing and Concentrating Machinery. Jackson Belt Lacers.
See our advertisement in this week's Iron Age—or last week's Iron Trade Review.

Thomas Spacing Machine Co.
THOMAS SPACING TABLES
Fulton Building
Pittsburgh, Pa.
THOMAS MULTIPLE PUNCHES
Eastern Sales Office:
915 Commercial Trust Bldg., Philadelphia, Pa.
Western Sales Office:
936 Monadnock Block, Chicago, Ill.

"STANDARD"
Well Made Products Include
Seamless Tube Mills • Lap and Butt Welded Pipe Mills • Bar and Sheet Mills • Cold Drawing Machinery Shears • Roll Lathes • Sand and Chilled Iron Rolls • Iron Castings, etc.
Standard Engineering Co., Ellwood City, Pa.

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MILWAUKEE, WIS. U.S.A.
Power and Electrical Machinery, Steam, Gas and Oil Engines, Centrifugal Pumps, Condensers, Air Compressors, Power Transmission Machinery, Dust Collectors, etc.

TREADWELL
Better Grade Machinery
Merchant Mills
Wire Rod Mills
Hot Strip Mills
Hoisting Machinery
Special Machinery
Steel and Iron Castings
Treadwell Engineering Company, Easton, Pa.

MORGAN CONSTRUCTION COMPANY
Rolling Mills
Wire Mills
Producer Gas Machines
Reversing Valves
(See first issue each month for SPECIAL ANNOUNCEMENT)
WORCESTER MASS., U. S. A.

CHAMBERSBURG
Steam, Steam Drop, and Board Drop Hammers
Trimming Presses
Punches and Shears
Hydraulic Machinery of all Types and Sizes
Presses, Riveters, Pumps and Accumulators
Special Machinery Designed and Built
Chambersburg Engineering Co., Chambersburg, Pa.

Sleeper & Hartley
Worcester, Mass.
Designers and Builders of
Continuous Wire Drawing Machines
Look for our full page advertisement in the first issue of each month.

AGNEW AUTOMATIC WELDERS
Years of engineering experience at your service on Automatic and Multiple spot and butt welding.
Let us quote you on Spot, Butt, Seam and A. C. Arc Welders.
Agnew Electric Welder Co.
Milford, Mich.

MORTON'S Keyway Cutters
Write for Bulletin No. 1-H. It contains descriptions and illustrations which will convince you that we have kept our machines in the lead as to accuracy, efficiency, design and *results*.
Morton Manufacturing Co.
Muskegon Heights, Mich.

FERROALLOYS
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co., 30 Church St., New York City.
Metal & Thermit Corp., 120 Broadway, New York City.

FERROCARBON TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

FERROCHROME
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.

FERROMANGANESE
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.

FERROPHOSPHORUS
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FERROSILICON
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FERROVANADIUM
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Vanadium Corp. of America, 120 Broadway, New York City.

FIRE BRICK AND CLAY
Ashland Fire Brick Co., Ashland, Ky.
Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia, Pa.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Climax Fire Brick Co., Climax, Pa.
Crescent Refractories Co., Curwensville, Clearfield Co., Pa.
Dover Fire Brick Co., 1012 Nat'l City Bank Bldg., Cleveland, O.
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Haws Refractories Co., Johnstown, Pa.
Hydraulic Press Brick Co., Central National Bank Bldg., St. Louis, Mo.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede Christy Clay Products Co., St. Louis, Mo.
Portsmouth Refractories Co., Portsmouth, O.
Queen's Run Refractories Co., Inc., Lock Haven, Pa.
Stowe-Fuller Refractories Co., The, 1650 Union Trust Bldg., Cleveland, O.
Superior Basic Brick Co., 517 Bessemer Bldg., Pittsburgh, Pa.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
U. S. Refractories Corp., Mt. Union, Pa.
Walsh Fire Clay Products Co., 4070 N. Main St., St. Louis, Mo.

FIRE CLAY (Ground)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
U. S. Refractories Corp., Mt. Union, Pa.

FIRE DOORS AND SHUTTERS
Kinnear Mfg. Co., The, 518-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

FLANGES (Pipe)
Dart, E. M., Mfg. Co., Providence, R. I.

FLASKS (Foundry)
Truscon Steel Co., Youngstown, O.

FLASKS (Snap)
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Diamond Clamp & Flask Co., Richmond, Ind.

FLOORING (Steel, Ventilating, Nonslipping, Fireproof)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

FLOOR PLATES (Rolled Steel)— See **PLATES (Rolled Steel—Floor)**

FLUORSPAR
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FLUX (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

FORGES
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.

FORGING BILLETS
Andrews Steel Co., Newport, Ky.
Central Alloy Steel Corp., Massillon, O.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

FORGING BILLETS (Alloy and Carbon Steel)
Central Alloy Steel Corp., Massillon, O.

FORGING FURNACES
Best, W. N., Corp., 11 Broadway, New York City.
Chapman-Stein Furnace Co., Mt. Vernon, Ohio.

FORGING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
National Machinery Co., The, Tiffin, O.

FORGINGS (Brass, Bronze and Copper)
American Brass Co., 25 Broadway, New York City.

FORGINGS (Drop)
Bay City Forge Co., Erie, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canton Forge & Axle Co., 2001-2037 Deuber Ave., Canton, O.
Champion Machine & Forging Co., 3675 E. 78th St., Cleveland, O.
Columbus Forge & Iron Co., Columbus, O.
Drop Forging Co. of New York, 324 West Side Ave., Jersey City, N. J.
Eagle Bolt & Forging Co., The, 1435 E. 45th St., Cleveland, O.
Eccles, Richard Co., Auburn, N. Y.
Heppenstall Forge & Knife Co., Arsenal Station, Pittsburgh, Pa.
Kropp Forge Co., 5301 W. Roosevelt Rd., Chicago, Ill.
Oliver Iron & Steel Corp., So. 10th & Muriel Sts., Pittsburgh, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Queen City Forging Co., The, 235 Tennyson St., Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Scranton Forging Co., Scranton, Pa.
Strieby & Foote Co., 301 Ogden St., Newark, N. J.
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.

FORGINGS (Iron and Steel)
Bay City Forge Co., Erie, Pa.
Bethelehem Steel Co., Bethlehem, Pa.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
Columbus Forge & Iron Co., Columbus, O.
Drop Forging Co. of New York, 324 West Side Ave., Jersey City, N. J.
Eccles, Richard, Co., Auburn, N. Y.
Heppenstall Forge & Knife Co., Arsenal Station, Pittsburgh, Pa.
Kropp Forge Co., 5301 W. Roosevelt Rd., Chicago, Ill.
Leard, Wm., Co., The, New Brighton, Pa.
McMyler-Interstate Co., Bedford, O.
Mesta Machine Co., Homestead Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Rockford Drop Forge Co., Rockford, Ill.
Tioga Steel & Iron Co., 52nd & Grays Ave., Philadelphia, Pa.
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Vanadium Corp. of America, 120 Broadway, New York City.
Wilcox, D., Mfg. Co., Mechanicsburg, Pa.

FOUNDRY EQUIPMENT AND SUPPLIES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka Ind.
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.
Whiting Corp., Harvey, Ill.

FRAMES (Wire Drawing)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FUEL OIL BURNING SYSTEMS AND PLANTS
Best, W. N. Corp., 11 Broadway, New York City.
Fuller-Lehigh Co., Fullerton, Pa.

FURNACE INSULATION
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 11 Broadway, New York City.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

FURNACE LININGS
Ashland Fire Brick Co., Ashland, Ky.

FURNACES (Annealing, Case Hardening and Heat Treating)
Best, W. N., Corp., 11 Broadway, New York City.
Chapman-Stein Furnace Co., Mt. Vernon, O.
Combustion Engineering Corp., 200 Madison Ave., New York City.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Electric Furnace Co., The, 538 Wilson St., Salem, O.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Holcroft & Co., 6545 Epworth Blvd., Detroit, Mich.
International Furnace Co., Keenan Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 326 Frankfort Ave., Cleveland, O.

FURNACES (Blast)
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Pennsylvania Engineering Works, New Castle, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

FURNACES (Electric)
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 326 Frankfort Ave., Cleveland, O.
Swindell, Wm., & Brothers Co., P. O. Box 1753, Pittsburgh, Pa.

FURNACES (Electric for Nonferrous Metals)
Electric Furnace Co., The, 538 Wilson St., Salem, O.

FURNACES (Electric Melting)
American Bridge Co., 71 Broadway, New York City.
Electric Furnace Co., The, 538 Wilson St., Salem, O.
General Electric Co., Schenectady, N. Y.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Payne, N. B., & Co., 25 Church St., New York City.
Pittsburgh Electric Furnace Co., 32nd St. and Putney Way, Pittsburgh, Pa.

FURNACES (Open-Hearth)
Chapman-Stein Furnace Co., Mt. Vernon, O.
International Furnace Co., Keenan Bldg., Pittsburgh, Pa.
Laughlin, Alex., & Co., First National Bank Bldg., Pittsburgh, Pa.
Smythe, S. R., Co., Oliver Bldg., Pittsburgh, Pa.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O

FURNACES (Porcelain Enameling)
Ferro Enamel Supply Co., The, Keith Bldg., Cleveland, O.

FURNACES (Recuperative)
Chapman-Stein Furnace Co., Mt. Vernon, Ohio.
Combustion Engineering Corp., 200 Madison Ave., New York City.
Electric Furnace Co., The, 538 Wilson St., Salem, O.
International Furnace Co., Keenan Bldg., Pittsburgh, Pa.

FURNACES (Sheet and Tin Mill)
Costello Engineering Co., 519 Oliver Bldg. Pittsburgh, Pa.
International Furnace Co., Keenan Bldg., Pittsburgh, Pa.

GAGES (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GAGGERS
Franklin Core Rod & Gagger Co., Franklin, Pa.

GALVANIZING
Cattie Brothers Corp., Tioga St., Philadelphia, Pa.
Cattie, Joseph P., & Brothers, Gaul & Letterly Sts., Philadelphia, Pa.
Hanlon-Gregory Galvanizing Co., 5515 Butler St., Pittsburgh, Pa.

GALVANIZING ENGINEER
Spowers, Wm. H., Jr., 50 Church St., New York City

GALVANIZING (Hot Dip)
Cattie, Joseph P., & Brothers, Gaul & Letterly Sts., Philadelphia, Pa.
Gray-Gregory Galvanizing Co., 220 Larkin St., Buffalo, N. Y.
Hanlon-Gregory Galvanizing Co., 5515 Butler St., Pittsburgh, Pa.

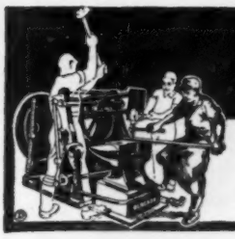
GALVANIZING PLANTS (For Sheets)
Erie Foundry Co., Erie, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

GAS (Welding and Cutting)
Prest-O-Lite Co., Inc., The, 30 E. 42nd St., New York City.

GAS BOOSTERS (Rotary Positive Pressure)
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

GAS EXHAUSTERS
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below



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"Now the Hand Anvil —is Worked by Machine!"

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72 East 45 St. New York.

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where it is essential to have
Economy-Speed-Reliability
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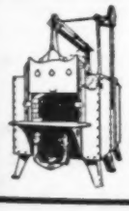

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For Rolling Special Shapes 40 Sizes

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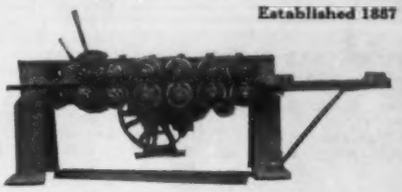

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CONTRACTING ENGINEERS

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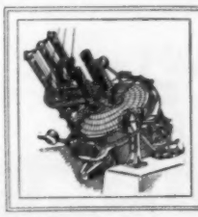

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Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.
Wood, R. D., & Co., 400 Chestnut Ave., Philadelphia, Pa.

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Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

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Buffalo Bronze Die Cast Corp., 100 Arthur St., Buffalo, N. Y.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.
Transue & Williams Steel Forging Corp., Alliance, Ohio.

GEAR GENERATORS
Farrel Foundry & Machine Co., Buffalo, N. Y.

GEARS (Bakelite)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Chicago Rawhide Mfg. Co., The, 1305 Elston Ave., Chicago, Ill.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

GEARS (Bevel-Generated Tooth)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

GEARS (Herringbone)
Farrel Foundry & Machine Co., Buffalo, N. Y.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.

GEARS (Machine Molded)
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.
Taylor-Wilson Manufacturing Co., McKees Rocks, Pa.

GEARS (Miter, Ring, Spiral, Worm)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Chicago Gear Mfg. Co., 2827 Fulton St., Chicago, Ill.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.
Philadelphia Gear Works, E. Tioga, Philadelphia, Pa.

GEARS (Rawhide)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

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General Electric Co., Schenectady, N. Y.
Johnson, Carlyle, Machine Co., Manchester, Conn.

GEARS AND GEAR CUTTING
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
American Adamite Co., The, 12th and Etna Sts., Pittsburgh, Pa.
Norfolk Downs, Mass.
Chicago Gear Mfg. Co., 2827 Fulton St., Chicago, Ill.
Farrel Foundry & Machine Co., Buffalo, N. Y.
Fawcus Machine Co., 2818 Smallman St., Pittsburgh, Pa.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.
James, D. O., Mfg. Co., 1120 W. Monroe St., Chicago, Ill.
Johnson, Carlyle, Machine Co., Manchester, Conn.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Ross-Meehan Foundries, Chattanooga, Tenn.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Simonds Mfg. Co., 25th St. and Liberty Ave., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Boston Gear Works Sales Co.,

GENERATING SETS
General Electric Co., Schenectady, N. Y.

GENERATORS (Acetylene) — See ACETYLENE GENERATORS

GENERATORS (Direct and Alternating Current)
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

GENERATORS (Electric)
Lincoln Electric Co., The, Coit Rd. and Kirby Ave., Cleveland, O.

GLASS CLEANERS (Liquid and Powder)
Skybryte Co., The, Keith Bldg., Cleveland, O.

GLOVES (Asbestos)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GLOVES (Steel Grip)
Industrial Gloves Corp., 1213 Fullerton Ave., Chicago, Ill.

GOGGLES (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

GRATING-STEEL (Subway, Area, Sidewalk, Ventilation, Non-Slipping)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

GRILLES
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

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Landis Tool Co., Waynesboro, Pa.

GRINDERS (Electric-Pneumatic-Portable)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

GRINDERS (Pneumatic)
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

GRINDERS (Roll)
Farrel Foundry & Machine Co., Ansonia, Conn.
Landis Tool Co., Waynesboro, Pa.

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Zip Abrasive Co., The, 6007 Euclid Ave., Cleveland, O.

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Landis Tool Co., Waynesboro, Pa.

GRINDING PANS
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.
Phillips & McLaren Co., 24th & Smallman Sts., Pittsburgh, Pa.

GUARDS (Truck Radiator)
Irving Iron Works, Long Island City, N. Y.

GUARDS (Machinery)
Breese Bros. Co., The, 2347 Reading Rd., Cincinnati, O.

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Blacker Engineering Corp., Grand Central Terminal, New York City.

HAMMERS (Board Drop)
Erie Foundry Co., Erie, Pa.

HAMMERS (Chipping, Riveting and Calking)
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Ingersoll-Rand Co., 11 Broadway, New York City.

HAMMERS (Drop)
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Erie Foundry Co., Erie, Pa.
Moloch Foundry & Machine Co., Kaukauna, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Toledo Machine & Tool Co., Toledo, O.

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Bradley, C. C., & Son, Inc., 432 No. Franklin St., Syracuse, N. Y.
Erie Foundry Co., Erie, Pa.
Moloch Foundry & Machine Co., Kaukauna, Wis.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.

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Erie Foundry Co., Erie, Pa.

HANGERS (Door)
Myers, F. E., & Brothers Co., The, Ashland, Ohio.

HANGERS (Shaft)
Hyatt Roller Bearing Co., Newark, N. J.

HARDNESS TESTING MACHINES
Shore Instrument & Mfg. Co., Van Wyck Ave. & Carll St., Jamaica, N. Y.

HARDWOOD (Northern Wisconsin and Michigan)
Northern Hemlock & Hardwood Mfgrs. Assoc., Oshkosh, Wis.

HEAT TREATING (Commercial)
Lakeside Steel Improvement Co., The, 5418 Lakeside Ave., Cleveland, Ohio.

HOISTING MACHINERY
American Terry Derrick Co., South Kearney, N. J.
Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, O.
Illinois Malleable Iron Co., 1861 Diversey Blvd., Chicago, Ill.
McMyler-Interstate Co., Bedford, O
Marion Steam Shovel Co., The, Marion, Ohio.
Orton Crane & Shovel Co., 60 S. Dearborn St., Chicago, Ill.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Treadwell Engineering Co., Easton, Pa.

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Box Crane & Hoist Corp., Janney & Ontario Sts., Philadelphia, Pa.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, Ohio
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
Milwaukee Electric Crane & Mfg Corp., Milwaukee, Wis.
Roeper Crane & Hoist Works 1729 No. 10th St., Reading, Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

HOISTS (Pneumatic)
Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway New York City.
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

HOISTS (Portable)
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

HOOPS AND BANDS
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.
American Tube & Stamping Plant, The, Stanley Works, The, Bridgeport, Conn.
Ryerson, Joseph T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.

HOOPS AND BANDS (Strips)
Sharon Steel Hoop Co., Sharon, Pa.

HOSE (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

HOT BEDS
McKee, Willis, 2422 Euclid Ave., Cleveland Ohio.
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

HOT BLAST STOVES
McKee, Arthur G., & Co., 2423 Euclid Ave., Cleveland, O.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

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Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

HYDRAULIC MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Chambersburg Engineering Co. Chambersburg, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

HYDRAULIC PRESSES — See PRESSES (Hydraulic)

INDICATORS (High Resistance)
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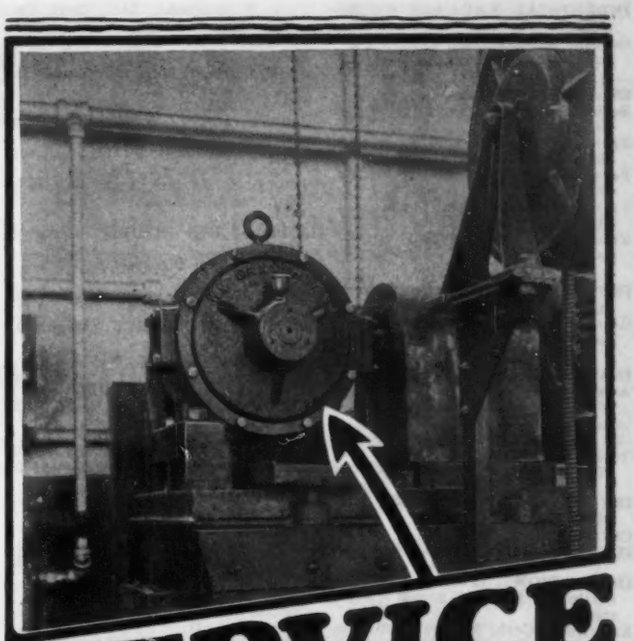

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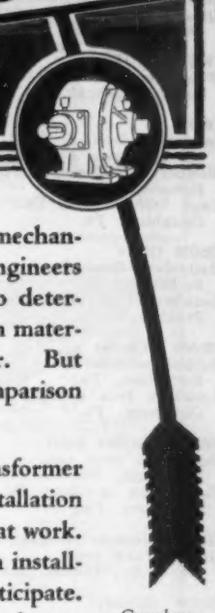

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Penn Mold & Mfg. Co., Wheeling, W. Va.
Valley Mould & Iron Corp., Sharpsville, Pa.
Vulcan Mold & Iron Co., Latrobe, Pa.

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General Electric Co., Schenectady, N. Y.

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Celite Products Co., 1822 So. Hope St., Los Angeles, Cal.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

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Celite Products Co., 1820 So. Hope St., Los Angeles, Cal.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

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Interstate Iron & Steel Co., 104 So. Michigan Ave., Chicago, Ill.
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Penn Iron & Steel Co., Creighton, Pa.

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Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

IRON (Chain)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Creighton, Pa.

IRON (Engine Bolt)
Bethlehem Steel Co., Bethlehem, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON (Norway-Swedish)
Brown-Wales Co., 493 C St., Boston, Mass.

IRON (Silvery)
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.

IRON (Stainless)
Allegheny Steel Co., Brackenridge, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.

IRON (Staybolt)
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Lockhart Iron & Steel Co., Pittsburgh, Pa.
Penn Iron & Steel Co., Creighton, Pa.

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Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Marquette Ore Co., Rockefeller Bldg., Cleveland, O.
Park & Williams, Inc., Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Quinn, Clement K., & Co., Duluth, Minn.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.

JOISTS AND STUDS (Pressed Steel)
Central Alloy Steel Corp., Massillon, O.
Truscon Steel Co., Youngstown, O.

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Morton Mfg. Co., Muskegon Heights, Mich.

KEYSEATING MACHINES
Morton Mfg. Co., Muskegon Heights, Mich.

KNIVES AND SHEAR BLADES —See SHEAR BLADES AND KNIVES

LADLES
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Truscon Steel Co., Youngstown, O.

LATH (Expanded Metal)
Central Alloy Steel Corp., Massillon, O.
Truscon Steel Co., Youngstown, O.

LATHES
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

LATHES (Roll Turning)
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
Standard Engineering Co., Ellwood City, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

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Farrell-Cheek Steel Foundry Co., Sandusky, O.
Strong, Carlisle & Hammond Co., The, 326 Frankfort Ave., Cleveland, O.

LEADER PINS AND BUSHINGS
Danly Machine Specialties, Inc., 4915 N. Lincoln Ave., Chicago, Ill.

LEATHER BELTING—See BELTING (Leather)

LEVELING MACHINES
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

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Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.
Ohio Electric & Controller Co., 5900 Maurice Ave., Cleveland, O.

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Benjamin Electric Mfg. Co., 120 S. Sangamin St., Chicago, Ill.

LOCK WASHER MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

LOCOMOTIVE CRANES — See CRANES (Locomotive)

LOCOMOTIVES (Electric)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
General Electric Co., Schenectady, N. Y.

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Vulcan Iron Works, 1730 Main St., Wilkes-Barre, Pa.

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Vulcan Iron Works, 1730 Main St., Wilkes-Barre, Pa.

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Northern Hemlock & Hardwood Mfrs. Assoc., Oshkosh, Wis.

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LUMBER (Flask)
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LUMBER (Template)
California White & Sugar Pine Mfrs. Assoc., 673 New Call Bldg., San Francisco, Calif.

MACHINE KEYS—See KEYS AND COTTER (Machine)

MACHINE WORK
Air Tight Steel Tank Co., Mansion and Gloster Sts., Pittsburgh, Pa.
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Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Johnson, Carlyle, Machine Co., Manchester, Conn.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.

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Ideal Machinery Co., Plainville, Conn.
Lucas, J. L., & Son, Inc., 3 Fox St., Bridgeport, Conn.
Marr-Galbreath Machinery Co., 58 Water St., Pittsburgh, Pa.
Miles Machinery Co., Saginaw, Mich.
Morey & Co., Inc., 410 Broome St., New York City.
Nashville Industrial Corp., Old Hickory, Tenn.
Niles, F. H., & Co., Inc., Claremont and Mallory Ave., Jersey City, N. J.
Potts, Henry, & Co., 1608 Bankers Trust Bldg., Philadelphia, Pa.
Scheinert, R., Co., 123-125 N. Third St., Philadelphia, Pa.
Simmons Machine Tool Corp., Albany, N. Y.
Wickes Machinery Co., Claremont and Mallory Aves., Jersey City, N. J.

MAGNETS (Lifting)—See LIFTING MAGNETS

MALLETS (Rawhide)
Chicago Rawhide Mfg. Co., The, 1305 Elston Ave., Chicago, Ill.

MANGANESE METALS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

MANGANESE ORE
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

MAGNESITE (Dead Burned)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

MANIFOLDS (Oxygen)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

MATERIAL HANDLING MACHINERY
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
McMyler-Interstate Co., Bedford, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

MEEHANITE METAL
Morrison, J. S., Co., Inc., 528 Oliver Bldg., Pittsburgh, Pa.

MERCHANT MILL EQUIPMENT
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

METAL (Perforated)—See PERFORATED METAL

METAL CLEANERS
American Chemical Paint Co., Ambler, Pa.
Ford, J. B., Co., The, Wyandotte, Mich.

METAL RUST PROOFING
Parker Rust-Proof Co., 2184 E. Milwaukee Ave., Detroit, Mich.

METAL SPECIALTIES AND PARTS
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Mundt, Chas., & Sons, Johnston & Fairmount Aves., Jersey City, N. J.

METALS (Nonferrous)
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

METAL STAMPINGS — See STAMPINGS

METAL WORKING MACHINES—See SHEET METAL WORKING MACHINERY

METERS (Gas and Air)
Connersville Blower Co., The, Connersville, Ind.
Cutler-Hammer Mfg. Co., Milwaukee, Wis.
General Electric Co., Schenectady, N. Y.
Roots, P. H. & F. M., Co., The, Connersville, Ind.

MILLING MACHINES
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

MILLS (Blooming, Universal, Plate, Sheet, Etc.)
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Treadwell Engineering Co., Easton, Pa.

MINING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

MIXERS (Sand)—See SAND MIXERS, CUTTERS AND SIFTERS MIXING, KNEADING, TEMPERING AND PUGGING MACHINERY
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

MOLDING MACHINES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.
Herman Pneumatic Machine Co., 806 Union Bank Bldg., Pittsburgh, Pa.

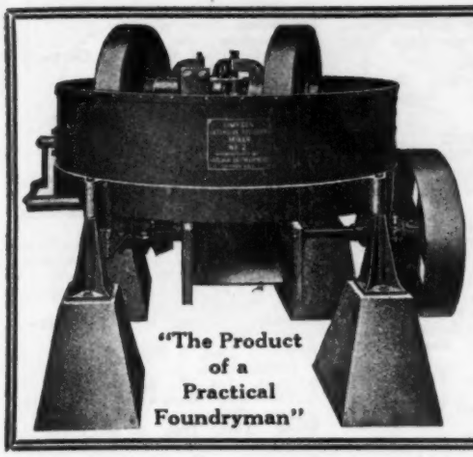
MOLDING MACHINES (Tractor Type Sand Throwing)
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

MOLDS (Ingot) — See INGOT MOLDS

MOLYBDENUM
Molybdenum Corp. of America, Empire Bldg., Pittsburgh, Pa.

MONEL METAL
International Nickel Co., 67 Wall St., New York City.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below



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Lincoln Electric Co., The, Coit Rd., and Kirby Ave., Cleveland, O.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

MUCK BAR
Bethlehem Steel Co., Bethlehem, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

NAILS
American Steel & Wire Co., 208 S. La Salle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

NAILS (Coated and Galvanized)
Youngstown Sheet & Tube Co., The, Youngstown, O.

NICKEL
American Mond Nickel Co., Clearfield, Pa.
International Nickel Co., 67 Wall St., New York City.
United States Nickel Co., New Brunswick, N. J.
Williams & Co., Inc., 915-987 Pennsylvania Ave., Pittsburgh, Pa.

NICKEL STEEL (Cold Drawn)
Bethlehem Steel Co., Bethlehem, Pa.

NIPPLES (Brass and Iron)
Liberty Iron Pipe & Nipple Works, 62 Greene St., New York City.

NITROGEN (Gas)
Linde Air Products Co., 30 E. 42nd St., New York City.

NUTS
Bethlehem Steel Co., Bethlehem, Pa.
Clark Bros. Bolt Co., Milldale, Conn.
Lake Erie Bolt & Nut Co., 915 E. 63rd St., Cleveland, O.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Rhode Island Tool Co., Providence, R. I.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS (Semi-Finished)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

OIL (Fuel)—See FUEL OIL

OIL BURNING EQUIPMENT
Best, W. N., Corp., 11 Broadway, New York City.
Hauck Mfg. Co., 114 Tenth St., Brooklyn, N. Y.

OIL PANS
Transue & Williams Steel Forging Corp., Alliance, Ohio.

OPEN-HEARTH FURNACES—See FURNACES (Open Hearth)

ORES-CHROME (Lump or Ground)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

OVENS (Coke By-Product Recovery)
Koppers Co., The, Pittsburgh, Pa.

OXY-ACETYLENE WELDING AND CUTTING—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

OXYGEN IN CYLINDERS
Linde Air Products Co., 30 E. 42nd St., New York City.

PACKING (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

PAINTS
Truscon Steel Co., Youngstown, O.

PATTERN LUMBER (White and Sugar Pine)
California White & Sugar Pine Mfrs. Assoc., 673 New Call Bldg., San Francisco, Calif.

PERFORATED METAL
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Harrington & King Perforating Co., The, 5654 Fillmore St., Chicago, Ill.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Mundt, Chas. & Sons, Johnston & Fairmount Ave., Jersey City, N. J.
Reliable Perforating Co., 1925 N. Paulina St., Chicago, Ill.
Standard Stamping & Perforating Co., 4720-22 W. 5th Ave., Chicago, Ill.

PERMANENT MOLDING MACHINES—See MOLDING MACHINES (Permanent)

PICKLE ROOM SUPPLIES
Ferro Enamel Supply Co., The, Keith Bldg., Cleveland, O.

PICKLING COMPOUND
American Chemical Paint Co., Ambler, Pa.
Hearne, William W., Inc., Real Estate Trust Bldg., Philadelphia, Pa.

PICKLING MACHINES
Mesta Machine Co., Homestead, Pa.

PICKS, MATTOCKS, ETC.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.

PIG IRON
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Eaton, Rhodes & Co., First National Bank Bldg., Cincinnati, O.
Globe Iron Co., Jackson, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Mohr, J. J., & Son, Bullitt Bldg., Philadelphia, Pa.
Park & Williams, Inc., Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co, Union Trust Bldg., Cleveland, O.
Pilling & Co, Inc., 1500 Chestnut St. Philadelphia, Pa.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.
Stewart Furnace Co., 1854 Union Trust Bldg., Cleveland, O.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.
Valley Mould & Iron Corp., Sharpsville, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

PILE DRIVERS
McMyler Interstate Co., Bedford, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

PILING (Steel Sheet)
Bethlehem Steel Co., Bethlehem, Pa.
Wemlinger, Inc., 149 Broadway, New York City.
Zelnicker, W. A., Supply Co. 511 Locust St., St. Louis, Mo.

PINIONS—See GEARS AND GEAR CUTTING

PIPE (Brass, Bronze and Copper)
American Brass Co., 25 Broadway, New York City.

PIPE (Cast Iron)
United States Cast Iron Pipe & Foundry Co., Burlington, N. J.

PIPE (Iron)
Liberty Iron Pipe & Nipple Works, 62 Greene St., New York City.

PIPE (Riveted Steel)
Abendroth & Root Mfg. Co., Woolworth Bldg., New York City.

PIPE (Spiral Riveted)
Abendroth & Root Mfg. Co., Woolworth Bldg., New York City.

PIPE (Standard)
Wheeling Steel Corp., Wheeling, W. Va.

PIPE (Steel)
Allegheny Steel Co., Brackenridge, Pa.
Central Tube Co., First National Bank Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, O.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE (Wrought Steel)
Central Tube Co., First National Bank Bldg., Pittsburgh, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PIPE AND FITTINGS (Acid Resisting)
Duriron Co., Inc., The, Dayton, Ohio.

PIPE BENDING MACHINES
American Pipe Bending Machine Co., 93 Pearl St., Boston, Mass.

PIPE CUTTING AND THREADING MACHINERY
Cox & Sons Co., The, Bridgeport, N. J.
Curtis & Curtis Co., 316 Garden St., Bridgeport, Conn.
Jarecki Mfg. Co., Erie, Pa.
Landis Machine Co., Waynesboro Pa.
Standard Engineering Co., Ellwood City, Pa.

PIPE FITTINGS
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.
Jenkins Bros., 80 White St., New York City.
Liberty Iron Pipe & Nipple Works, 62 Greene St., New York City.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PIPE MILL MACHINERY
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE STRAIGHTENING MACHINES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PIPE WRENCHES—See WRENCHES (Pipe)

PIPING CONTRACTORS
Floersheim, B., & Co., 622 Farmers Bank Bldg., Pittsburgh, Pa.
Power Piping Co., 829 Beaver Ave., Pittsburgh, Pa.

PLANERS AND SHAPERS
Morton Mfg. Co., Muskegon Heights, Mich.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

PLATE CASTORS
Hyatt Roller Bearing Co., Newark, N. J.

PLATES (Circular and Disc Steel)
Truscon Steel Co., Youngstown, O.

PLATES (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.

PLATES (Rolled Steel—Floor)
American Pressed Steel Co., Commercial Trust Bldg., Philadelphia, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

PLATES (Sheared and Universal)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Iron & Steel Co., Harrisburg, Pa.
Granite City Steel Works, The, Granite City, Ill.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1214 Wabansia Ave. Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Morris & Bailey Division, Oliver Iron & Steel Corp., Wilson Station, Pittsburgh, Pa.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PLATES (Terne and Tin)—See TIN PLATE

PLATING (Chrome Alloy)
Chromium Corp. of America, 26 Broadway, New York City

PLATING (Rust, Acid, and Heat Resisting)
Chromium Corp. of America, 26 Broadway, New York City.

PNEUMATIC TOOLS—See TOOLS—(Pneumatic)

POLES (Tubular Steel)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

PORCELAIN ENAMELING EQUIPMENT
Ferro Enamel Supply Co., The, Keith Bldg., Cleveland, O.

PORTABLE LOADERS (Bucket or Belt)
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

POWDERED COAL EQUIPMENT
Combustion Engineering Corp., 200 Madison Ave., New York City.
Fuller-Lehigh Co., Fullerton, Pa.

POWER TRANSMISSION
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

PREHEATING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

PRESSED METAL—See STAMPINGS

PRESSED STEEL PARTS—See STAMPINGS

PRESSES
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works, 3917 St. Clair Ave., Cleveland, O.
Erie Foundry Co., Erie, Pa.
Federal Press Co., Elkhart, Ind.
Loshbough-Jordan Tool & Machine Co., Elkhart, Ind.
Mesta Machine Co., Homestead, Pa.
Moloch Foundry & Machine Co., Kaukauna, Wis.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Toledo Machine & Tool Co., Toledo, O.
V & O Press Co., Hudson, N. Y.

PRESSES (AUTOMATIC RIDGE ROLL & GUTTER)
Streine Tool & Mfg. Co., The, New Bremen, O.

PRESSES (Die Cutting)
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Forging)
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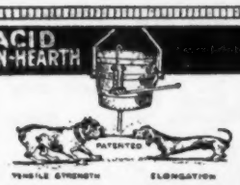

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Chambersburg Engineering Co., Chambersburg, Pa.
Farrel Foundry & Machine Co., Ansonia, Conn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

PRESSES (Metal Drawing, Etc.)
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Federal Press Co., Elkhart, Ind.
Loshbough-Jordan Tool & Machine Co., Elkhart, Ind.

PRESSES (Roofing & Corrugating)
Loshbough-Jordan Tool & Machine Co., Elkhart, Ind.
Streine Tool & Mfg. Co., The, New Bremen, O.

PRESSES (Scrap Bundling and Baling)
Cox & Sons Co., The, Bridgeport, N. J.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Shaft and Pipe Straightening—Hydraulic)
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

PRESSES (Straightening)
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

PRESSES (Sub)
Danly Machine Specialties, Inc., 4915 N. Lincoln Ave., Chicago, Ill.
U. S. Tool Co., Inc., Ampere, N. J.

PRODUCER GAS SYSTEMS—See GAS PRODUCER PLANTS

PUMPS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Connersville Blower Co., The, Connersville, Ind.
Deming Co., The, Salem, Ohio.

PUMPS (Acid Resisting)
Duriron Co., Inc., The, Dayton, Ohio.

PUMPS (Air Lift)
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

PUMPS (Boiler Feed)
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS (Centrifugal)
Ingersoll-Rand Co., 11 Broadway, New York City.

PUMPS (Force)
Deming Co., The, Salem, Ohio.

PUMPS (Hand & Power)
Myers, F. E., & Brother Co., The, Ashland, Ohio.

PUMPS (Hydraulic)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

PUMPS (Industrial)
Deming Co., The, Salem, Ohio.

PUMPS (Power)
Deming Co., The, Salem, Ohio.

PUMPS (Spray)
Deming Co., The, Salem, Ohio.

PUMPS (Steam)
Ingersoll-Rand Co., 11 Broadway, New York City.

PUNCHES (Multiple)
Cleveland Punch & Shear Works Co., Inc., 3917 St. Clair Ave., Cleveland, Ohio.
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa.

PUNCHES AND DIES
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Marchant, George F., Co., 1434 So. Rockwell St., Chicago, Ill.

PUNCHES & SHEARS (Hand)
Whitney Metal Tool Co., Rockford, Ill.

PUNCHING AND SHEARING MACHINERY
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Chambersburg Engineering Co., Chambersburg, Pa.
Cleveland Punch & Shear Works, 3917 St. Clair Ave., Cleveland, O.
Long & Allstatter Co., Hamilton, O.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

PYROMETERS (Recording and Indicating)
Engelhard, Charles, Inc., 233 N. J. R. R. Ave., Newark, N. J.
Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

RACKS (Machine)
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

RAILS
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Frank, M. K., Union Trust Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

RAILS (Girder)
Bethlehem Steel Co., Bethlehem, Pa.

REDUCERS (Speed-Worm and Spur) See SPEED REDUCERS (Worm and Spur)

REFLECTORS (Electric Light)
Benjamin Electric Mfg. Co., 120 S. Sangamin St., Chicago, Ill.

REFRACTORIES
Ashland Fire Brick Co., Ashland, Ky.
Botfield Refractories Co., Swanson and Clymer Sts., Philadelphia, Pa.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Carborundum Co., The, Buffalo and 18th Sts., Niagara Falls, N. Y.
Crescent Refractories Co., Curwensville, Pa.
Dover Fire Brick Co., 1012 Nat'l City Bank Bldg., Cleveland, O.
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh, Pa.
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Hydraulic Press-Brick Co., Central National Bank Bldg., St. Louis, Mo.
Illinois Clay Products Co., 214 Barber Bldg., Joliet, Ill.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Queen's Run Refractories Co., Inc., Lock Haven, Pa.
Soisson, Joseph, Fire Brick Co., Connellsville, Pa.
Stowe-Fuller Refractories Co The, 1650 Union Trust Bldg., Cleveland, O.
Superior Basic Brick Co., 517 Bessemer Bldg., Pittsburgh, Pa.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.
U. S. Refractories Corp., Mt. Union, Pa.
Walsh Fire Clay Products Co., 4070 N. Main St., St. Louis, Mo.

REGISTERS (Heating and Ventilating)
Auer Register Co., The, Payne Ave. and E. 37th St., Cleveland, Ohio.

REGULATORS (Compressed Gas)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

REINFORCEMENTS (Steel)
Truscon Steel Co., Youngstown, O.

RHEOSTATS
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.

RINGS (Welded Iron & Steel)
Akron-Selle Co., Akron, O.

RIVET FORGES (Oil burning)
Hauck Mfg. Co., 114 Tenth St., Brooklyn, N. Y.

RIVET HEATERS (Electric)
General Electric Co., Schenectady, N. Y.

RIVET SETS
Cleveland Punch & Shear Works Co., Inc., 3917 St. Clair Ave., Cleveland, Ohio.
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell, Chicago, Ill.

RIVETERS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.

RIVETING MACHINERY
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Shuster, The F. B., Co., New Haven, Conn.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

RIVETS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Progressive Mfg. Co., Torrington, Conn.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

ROD MILLS
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.
Vaughn Machinery Co. The, Cuyahoga Falls, O.

RODS (Acid Resisting)
Alcumite Corp., The, Dayton, O.

RODS (Brass, Bronze, Copper and Nickel Silver)
American Brass Co., 25 Broadway, New York City.

RODS (Drill)
Globe Wire Co., Sharpsburg, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

RODS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.

RODS (Welding)—See WELDING RODS

ROLL GRINDERS
Farrel Foundry & Machine Co., Ansonia, Conn.

ROLL HEATERS (Electric)
Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.

ROLLING DOORS AND SHUTTERS
Kinnear Manufacturing Co., 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

ROLLING MACHINERY (CORRUGATING)
Streine Tool & Mfg. Co., The, New Bremen, O.

ROLLING MACHINERY (SHEET LEVELLER)
Streine Tool & Mfg. Co., The, New Bremen, O.

ROLLING MACHINERY (Sheet Metal)
Streine Tool & Mfg. Co., The, New Bremen, Ohio.

ROLLING MACHINERY (SHEET OILING)
Streine Tool & Mfg. Co., The, New Bremen, O.

ROLLING MILL BEARINGS
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearing Co., Stamford, Conn.

ROLLING MILL EQUIPMENT
Alliance Machine Co., The, Alliance, O.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.
Monessen Foundry & Machine Co., Monessen, Pa.
Morgan Construction Co., Worcester, Mass.
National Roll & Foundry Co., Avonmore, Pa.
Standard Engineering Co., Elwood City, Pa.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

ROLLING MILL FURNACES
Chapman-Stein Furnace Co., Mt. Vernon, Ohio.

ROLLING MILLS (Consulting Engineers)
Morgan Construction Co., Worcester, Mass.
Treadwell Engineering Co., Easton, Pa.

ROLLING MILLS (Contracting Engineers)
McKee, Arthur G., & Co., 2423 Euclid Ave., Cleveland, Ohio.

ROLLS (Steel)
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Hyde Park Foundry & Machine Co., Hyde Park, Pa.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Pittsburgh Rolls Corp., 41st St. and A. V. Ry., Pittsburgh, Pa.
Standard Engineering Co., Elwood City, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

ROLLS (Wood)
Dart, E. M., Mfg. Co., Providence, R. I.

ROOFING AND SIDING (Iron and Steel)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Newport Rolling Mill Co., Newport, Ky.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below

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RUST PREVENTATIVE
American Chemical Paint Co., Ambler, Pa.
Parker Rust-Proof Co., 2184 E. Milwaukee Ave., Detroit, Mich.

RUST REMOVING COMPOUND
American Chemical Paint Co., Ambler, Pa.

SAFE ENDS (Boiler Tube)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

SAFETY DEVICES (Electric)
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.

SAND
Portage Silica Co., The, 602 Stambaugh Bldg., Youngstown, O.
Standard Silica Co., 39 S. LaSalle St., Chicago, Ill.

SAND (Molding)
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Standard Silica Co., 39 S. LaSalle St., Chicago, Ill.

SAND (Sandblast)
Portage Silica Co., The, 602 Stambaugh Bldg., Youngstown, O.
Standard Silica Co., 39 S. LaSalle St., Chicago, Ill.
United States Silica Co., 122 South Michigan Ave., Chicago, Ill.

SAND (Silica)
Standard Silica Co., 39 S. LaSalle St., Chicago, Ill.
United States Silica Co., 122 So. Michigan Ave., Chicago, Ill.

SANDBLAST ABRASIVES (Shot and Grit)
Pittsburgh Crushed Steel Co., 61st & A. V. R. R., Pittsburgh, Pa.

SANDBLAST EQUIPMENT AND ACCESSORIES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Mott Sand Blast Mfg. Co., 4611-4621 Flournoy St., Chicago, Ill.
Pangborn Corp., P. O. Box 858, Hagerstown, Md.
Sly, W. W., Mfg. Co., 4700 Train Ave., Cleveland, O.

SAND CONVEYING AND HANDLING MACHINERY
Bartlett & Snow, C. O., Co., 6203 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

SAND MIXERS, CUTTERS AND SIFTERS
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

SAND MIXERS (Core and Facing Sand)
National Engineering Co., 549 W. Washington Blvd., Chicago, Ill.

SAND RAMMERS
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

SAND RECLAIMERS
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

SAND SLINGERS
Beardsley & Piper Co., 2541 N. Keeler Ave., Chicago, Ill.

SASH PAINT
Skybryte Co., The, Keith Bldg., Cleveland, O.

SASH (Steel Casement)
Truscon Steel Co., Youngstown, O.

SAW SHARPENING MACHINES
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.

SAWS (Cold and Hot Metal)
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Huther Bros. Saw Mfg. Co., 1190 University Ave., Rochester, N. Y.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

SAWS (High Speed Friction)
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

SCALES, AUTOMATIC DIAL (Heavy Duty, Bench, Overhead Track, Tank, Hanging, Packing, Counting, Special Purposes)
American Kron Scale Co., 430 E. 53rd St., New York City.
Fairbanks Co., Broome and Lafayette Sts., New York City.
Fairbanks, Morse Co., Inc., 900 So. Wabash Ave., Chicago, Ill.
Toledo Scale Co., Monroe and Albion Sts., Toledo, O.

SCALES (Dial)
American Kron Scale Co., 430 E. 53rd St., New York City.
Fairbanks Co., Broome and Lafayette Sts., New York City.
Fairbanks, Morse & Co., 900 So. Wabash Ave., Chicago, Ill.

SCALES (Industrial, Motor Truck, Railroad Track, Rolling Mill)
American Kron Scale Co., 430 E. 53rd St., New York City.
Fairbanks Co., Broome and Lafayette Sts., New York City.
Fairbanks, Morse & Co., Inc., 900 So. Wabash Ave., Chicago, Ill.

SCLEROSCOPES, HARDNESS MEASURING
Shore Instrument & Mfg. Co., Van Wyck Ave. and Carll St., Jamaica, N. Y.

SCRAP
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

SCRAP BALING PRESSES
Logemann Bros. Co., 3126 Burleigh St., Milwaukee, Wis.

SCRAP BUNDLING MACHINES (Wire Mills)
Vaughn Machinery Co., The, Cuyahoga Falls, O.

SCREENS
Chicago Perforating Co., 2445 W. 24th Place, Chicago, Ill.
Harrington & King Perforating Co., The, 5634 Fillmore St., Chicago, Ih.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Standard Stamping & Perforating Co., 4720-22 W. 5th Ave., Chicago, Ill.

SCREENS AND SIEVES
Erdle Perforating Co., 171 York St., Rochester, N. Y.
Mundt, Chas., & Sons, Johnston and Fairmont Aves., Jersey City, N. J.

SCREW MACHINE PRODUCTS
Link-Belt Co., P. O. Box 85, Indianapolis, Ind.
Milford Mfg. Co., The, 33 Buckingham Ave., Milford, Conn.
E. 49th St., Cleveland, O.
Wellman Products Co., The, 1448 E. 49th St., Cleveland, O.

SCREW STOCK (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

SCREW STOCK (Free Cutting)
Union Drawn Steel Co., Beaver Falls, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SCREWS
Clark Bros. Bolt Co., Milldale, Conn.
Progressive Mfg. Co., Torrington, Conn.

SCREWS (Cap and Heat Treated)
Rhode Island Tool Co., Providence, R. I.

SCREWS (Cap and Set)
Allen Mfg. Co., Hartford, Conn.

SCREWS (Lag)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

SEAMLESS STEEL TUBING—See TUBES (Cold Drawn Seamless Steel)

SEATS (Copper Valve)
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

SEPARATORS (Magnetic)
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.

SHAFT AND PIPE STRAIGHTENERS (Hydraulic)
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

SHAFT HANGERS
Hyatt Roller Bearing Co., Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.

SHAFTING
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Vanadium Corp. of America, 120 Broadway, New York City.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAFTING (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

SHAFTING (Cold Drawn and Turned)
Bethlehem Steel Co., Bethlehem, Pa.

SHAFTING (Turned and Polished)
Union Drawn Steel Co., Beaver Falls, Pa.

SHAPERS—See PLANERS AND SHAPERS

SHAPES (Steel) — See STEEL (Structural)

SHEAR BLADES AND KNIVES
Heppenstall Forge & Knife Co., Arsenal Station, Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell St., Chicago, Ill.

SHEARING MACHINERY (CONTINUOUS AUTOMATIC HOT MILL)
Streine Tool & Mfg. Co., The, New Bremen, O.

SHEARING MACHINERY (ROTARY GANG SLITTING)
Streine Tool & Mfg. Co., The, New Bremen, O.

SHEARING MACHINERY (SQUARING)
Streine Tool & Mfg. Co., The, New Bremen, O.

SHEARS
Beatty Machine & Mfg. Co., Hammond, Ind.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works Co., The, 3917 St. Clair Ave., Cleveland, O.
Farrel Foundry & Machine Co., Ansonia, Conn.
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.
National Roll & Foundry Co., Avonmore, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Toledo Machine & Tool Co., Toledo, O.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

SHEARS (Squaring)
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.

SHEET BARS
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Wheeling Steel Corp., Wheeling, W. Va.

SHEET METAL PRODUCTS—See STAMPINGS

SHEET METAL STRAIGHTENERS
Shuster, The F. B., Co., New Haven, Conn.

SHEET METAL WORK
Crosby Co., The, 183 Pratt St., Buffalo, N. Y.

SHEET METAL WORKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Cleveland Punch & Shear Works Co., Inc., 3917 St. Clair Ave., Cleveland, O.
Niagara Machine & Tool Works 685 Northland Ave., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Toledo Machine & Tool Co., Toledo, O.

SHEET MILLS
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.

SHEETS
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pttisburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Corp., Balfour Bldg., San Francisco, Calif.
Granite City Steel Works, The, Granite City, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Morris & Bailey Division, Oliver Iron & Steel Corp., Wilson Station, Pittsburgh, Pa.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Seneca Iron & Steel Co., Buffalo, N. Y.
Sheet Steel Trade Extension Committee, 715 Oliver Bldg., Pittsburgh, Pa.
Trumbull Steel Co., The, Warren, O.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS (Acid Resisting)
Alcumite Corp., The, Dayton, O

SHEETS (Automobile)
Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Newton Steel Co., Youngstown, O
Seneca Iron & Steel Co., Buffalo, N. Y.

SHEETS (Black)
Allegheny Steel Co., Brackenridge, Pa.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Youngstown, O
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Seneca Iron and Steel Co., Buffalo, N. Y.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

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Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., The, Mansfield, Ohio.
National Enameling & Stamping Co., Granite City, Ill.
Newport Rolling Mill Co., Newport, Ky.
Newton Steel Co., Youngstown, O.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Sharon Steel Hoop Co., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Trumbull Steel Co., The, Warren, O.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

SHEETS (Box Annealed)
Sharon Steel Hoop Co., Sharon, Pa.

SHEETS (Brass, Bronze, Copper and Nickel Silver)
American Brass Co., 25 Broadway, New York City.

SHEETS (Cold Rolled)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newton Steel Co., Youngstown, O.

SHEETS (Copper Steel)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.

SHEETS (Corrugated)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Weirton Steel Co., Weirton, W. Va.

SHEETS (Deep Stamping)
Allegheny Steel Co., Brackenridge, Pa.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newton Steel Co., Youngstown, O.

SHEETS (Electrical)
Allegheny Steel Co., Brackenridge, Pa.
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Trumbull Steel Co., The, Warren, O.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS (Galvanized)
American Rolling Mill Co., Middletown, O.
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Apollo Steel Co., Apollo, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Granite City Steel Works, The, Granite City, Ill.
National Enameling & Stamping Co., Granite City, Ill.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS (Locomotive Jacked)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.

SHEETS (Metal Furniture)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.

SHEETS (Perforated)
Erdle Perforating Co., 171 York St., Rochester, N. Y.

SHEETS (Pickled)
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Newton Steel Co., Youngstown, O.

SHEETS (Roofing) — See ROOFING AND SIDING

SHEETS (Tin)—See TIN PLATE

SHELVING (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

SHIPBUILDING SHAPES
Bethlehem Steel Co., Bethlehem, Pa.

SIEVES
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

SLABS
Andrews Steel Co., Newport, Ky.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Mansfield Sheet & Tin Plate Co., The, Mansfield, O.
Wheeling Steel Corp., Wheeling, W. Va.

SLEEVES AND NOZZLES
Tempest Brick Co., Ltd., The, House Bldg., Pittsburgh, Pa.

SOAKING PITS
Chapman-Stein Furnace Co., Mt. Vernon, O.

SPACING TABLES
Thomas Spacing Machine Co., Fulton Bldg., Pittsburgh, Pa

SPECIAL MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Lammert & Mann Co., Chicago, Ill.
National Roll & Foundry Co., Avonmore, Pa.
Smith Gas Engineering Co., Dayton, O.
Sutton-Abramson Engineering Co., Park Bldg., Pittsburgh, Pa.
Tioga Steel & Iron Co., 52nd & Grays Ave., Philadelphia, Pa.
Treadwell Engineering Co., Easton, Pa.
Wellman-Seaver-Morgan Co., 7025 Central Ave., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

SPECIAL SHAPES
Sharon Steel Hoop Co., Sharon, Pa.

SPECIAL SHAPES (Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

SPEED REDUCERS
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Rd., Chicago, Ill.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

SPEED REDUCERS (Worm & Spur)
Albaugh-Dover Mfg. Co., 2154 Marshall Blvd., Chicago, Ill.
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.
James, D. O., Mfg. Co., 1120 W. Monroe St., Chicago, Ill.
Philadelphia Gear Works, E. Tioga, Philadelphia, Pa.

SPIEGELEISEN
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

SPIKES
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.

SPRING MAKING MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

SPRINGS
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Barnes-Gibson-Raymond, Inc., 6400 Miller Ave., Detroit, Mich.
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Duer Spring & Mfg. Co., Pittsburgh, Pa.
Hubbard, M. D., Spring Co., Pontiac, Mich.
Peterson Spring Co., The, 1660 Beard Ave., Detroit, Mich.
Raymond Mfg. Co., Centre St., Corry, Pa.

SPRINGS (Car)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.

SPRINGS (Coil & Elliptic)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.

SPRINGS (Coil and Flat)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
Barnes-Gibson-Raymond, Inc., 4200 Miller Ave., Detroit, Mich.
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Hubbard, M. D., Spring Co., Pontiac, Mich.
Peterson Spring Co., The, 1660 Beard Ave., Detroit, Mich.
Raymond Mfg. Co., Centre St., Corry, Pa.

SPRUE CUTTERS
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Shuster, The F. B., Co., New Haven, Conn.

STACKS (Steel)
American Bridge Co., The, 71 Broadway, New York City.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Sotter Bros., Inc., Pottstown, Pa.
Truscon Steel Co., Youngstown, O.

STAMPINGS
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Tube & Stamping Plant, The, Stanley Works, The, Bridgeport, Conn.
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Breese Bros. Co., The, 2347 Reading Rd., Cincinnati, O.
Central Iron & Steel Co., Harrisburg, Pa.
Crosby Co., The, 183 Pratt St., Buffalo, N. Y.
G G G Metal Stamping Co., Dept. D, Warren, Pa.
Hubbard, M. D., Spring Co., Pontiac, Mich.
Joliet Wrought Washer Co., Joliet, Ill.
Lansing Stamping Co., Lansing, Mich.
Motor Wheel Corp., Lansing, Mich.
Transue & Williams Steel Forging Corp., Alliance, O.
Truscon Steel Co., Youngstown, O.

STAMPINGS (Aluminum, Bronze, Copper, Brass, Steel)
Akron-Selle Co., Akron, O.

STARTERS (Electric Motor)
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.

STEEL
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Gulf States Steel Co., Birmingham, Ala.
Illinois Steel Co., 208 So. La Salle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1819 Wabansia Ave., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Agricultural)
Bethlehem Steel Co., Bethlehem, Pa.

STEEL (Alloy)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Hawkridge Bros., 303 Congress St., Boston, Mass.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Ludlum Steel Co., Watervliet, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., The, Canton, O.
Vanadium Corp. of America, 120 Broadway, New York City.
Wheelock, Lovejoy & Co., 128 Sidney St., Cambridge, Mass.

STEEL (Alloy, Cold Drawn)
Timken Roller Bearing Co., The, Canton, O.
Union Drawn Steel Co., Beaver Falls, Pa.

STEEL (Case Hardened)
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

STEEL (Cold Drawn)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Globe Wire Co., Sharpsburg, Pa.
Hawkridge Bros., 303 Congress St., Boston, Mass.
Kidd Drawn Steel Co., Aliquippa, Pa.
Moltrup Steel Products Co., Beaver Falls, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Products Co., Monaca, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Crucible)
Columbia Tool Steel Co., Chicago Heights, Ill.
Firth-Sterling Steel Co., McKeesport, Pa.
Hawkridge Bros., 303 Congress St., Boston, Mass.

STEEL (Electric)
Ludlum Steel Co., Watervliet, N. Y.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below

FORGINGS

Forgings

Crankshafts
Connecting Rods
Shafting
Hollow Bored Forgings

BAY CITY FORGE CO., Erie, Pa.

FORGINGS
DIE BLOCKS
SHEAR KNIVES
Heppenstall Forge & Knife Co.
Pittsburgh WORKS Bridgeport
Offices in Principal Cities

DIE BLOCKS · PISTON RODS
TRIMMER STEELS
The Green Die Block

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UNION ELECTRIC STEEL CORP.
Pittsburgh, Penna.

Drop Forgings to Order
THE SCRANTON FORGING CO.
SCRANTON, PA.

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DROP FORGINGS
The D. Wilcox Manufacturing Co.
Mechanicsburg, Pa.

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STEEL & IRON FORGINGS ALL SIZES & SHAPES
Shafts
Hooks
Gear Blanks
Die Blocks
Forged Steel Pipe Flanges
PHILADELPHIA STEEL & IRON CO.
Offices: 1008 Commercial Trust Bldg.
Works: 33rd and Gray's Ferry Rd., PHILADELPHIA, PA.

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Send models or blue prints for quotations.
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Copper *Monel Metal*
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K
DROP AND HAMMER FORGINGS
HEAVY and LIGHT
CHICAGO, ILL.

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Send samples or blue prints for quotations.
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ROCKFORD, ILLINOIS

STEEL (High Speed)
Allen, Edgar, Steel Co., Inc., 718-722 W. Lake St., Chicago, Ill.
Columbia Tool Steel Co., Chicago Heights, Ill.
Firth-Sterling Steel Co., McKeesport, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Vanadium Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

STEEL (Oil Hardening)
Columbia Tool Steel Co., Chicago Heights, Ill.

STEEL (Open Hearth)
Central Alloy Steel Corp., Massillon, O.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Washburn Wire Co., Phillipsdale, R. I.

STEEL (Open-hearth—Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

STEEL (Rustless)
Firth-Sterling Steel Co., McKeesport, Pa.
Ludlum Steel Co., Watervliet, N. Y.

STEEL (Screw Stock)
Superior Steel Products Co., Monaca, Pa.

STEEL (Spring)
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

STEEL (Stainless)
Allegheny Steel Co., Brackenridge, Pa.
Firth-Sterling Co., McKeesport, Pa.

STEEL (Stamping and Drawing)
Columbia Steel Co., Standard Life Bldg., Pittsburgh, Pa.
Griffin Mfg. Co., 15th and Cherry Sts., Erie, Pa.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.

STEEL (Strip, Hot and Cold Rolled)
Acme Steel Co., 2840 Archer Ave., Chicago, Ill.
American Tube & Stamping Plant, The, Stanley Works, The, Bridgeport, Conn.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., Standard Life Bldg., Pittsburgh, Pa.
Elliott-Blair Steel Co., New Castle, Pa.
Griffin Mfg. Co., 15th and Cherry Sts., Erie, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis Mo.
Morris & Bailey Division, Oliver Iron & Steel Corp., Wilson Station, Pittsburgh, Pa.
Pittsburgh Cold Rolled Steel Co., Verona, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.

STEEL (Structural)
Alliance Structural Co., The, Alliance, O.
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Bollinger-Andrews Construction Co., 1016 Empire Bldg., Pittsburgh, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Eichleay, John, Jr., Co., So. 20th and Wharton, Pittsburgh, Pa.
Erie Steel Construction Co., The, Erie, Pa.
Fleming Mfg. Co., New Castle, Pa.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Kratzer W. N., Co., 3212 Smallman St., Pittsburgh, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Ohio Structural Steel Co., The, Newtown Falls, O.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Truscon Steel Co., Youngstown, O.
Wallace Equipment Co., 11th St., S. W. & Hanford, Seattle, Wash.

STEEL (Tool)
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Tool Steel Co., Chicago Heights, Ill.
Firth-Sterling Co., McKeesport, Pa.
Hawkridge Bros., 303 Congress St., Boston, Mass.
Kidd Drawn Steel Co., Aliquippa, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Ludlum Steel Co., Watervliet, N. Y.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Vanadium Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

STEEL BUILDINGS—See BRIDGES, BUILDINGS AND VIADUCTS

STEEL CARBON
Bethlehem Steel Co., Bethlehem, Pa.

STEEL DOORS AND SHUTTERS
Kinnear Mfg. Co., 818-868 Field Ave., Columbus, O.

STEEL FABRICATORS—See BRIDGES, BUILDINGS AND VIADUCTS

STEEL PLATE CONSTRUCTION
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Hammond Iron Works, Warren, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Pennsylvania Engineering Works, New Castle, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sotter Bros., Inc., Pottstown, Pa.
Steel Plate Products Co., Pottstown, Pa.

STEEL PLATES — See PLATES (Iron and Steel)

STEEL STAMPINGS—See STAMPINGS

STELLITE
Haynes Stellite Co., 30 E. 42nd St., New York City.

STEP HANGERS
Transue & Williams, Steel Forging Corp., Alliance, O.

STEPS (Ladder and Stair, Nonslipping)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

STOCK LINE RECORDER (Electric)
Freyn Engineering Co., 310 S. Michigan Ave., Chicago, Ill.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Combustion Engineering Corp., 200 Madison Ave., New York City.

STOOLS AND FACTORY EQUIPMENT (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

STRAIGHTENING MACHINERY
Shuster, The F. B., Co., New Haven, Conn.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.

STRIP MILLS (Hot or Cold)
Treadwell Engineering Co., Easton, Pa .

STRIP STEEL STRAIGHTENERS
Shuster, The F. B., Co., New Haven, Conn.

STRIP (Steel)
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.

STRIP (Steel and Cold Rolled)—See STEEL (Strip, Hot or Cold Rolled)

STRUCTURAL IRON AND STEEL WORK — See STEEL (Structural)

SUB-PRESSES — See PRESSES (Sub.)

SULPHURIC ACID
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.

SWITCH STANDS
Bethlehem Steel Co., Bethlehem, Pa.

SWITCHBOARDS
Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

SWITCHES (Electric)
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland, O.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

TANKS (Acetylene)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

TANKS (Storage, Pressure, Riveted, Welded)
Air Tight Steel Tank Co., Mansion and Gloster Sts., Pittsburgh, Pa.
Hammond Iron Works, Warren, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sotter Bros., Inc., Pottstown, Pa.
Steel Plate Products Co., Pottstown, Pa.

TAPPING MACHINES
National Machinery Co., The, Tiffin, O.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

TAPPING MACHINES (Friction Drive Type)
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

TAPS (Collapsible)
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

TAPS AND DIES
Landis Machine Co., Waynesboro, Pa.

TERNE PLATE
American Steel & Tin Plate Co. Frick Bldg., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va,

TESTING MACHINES (Pipe)
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

THERMO COUPLES
Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

THREAD CUTTING TOOLS
Landis Machine Co., Waynesboro, Pa.

THREADING MACHINERY
National Machinery Co., The, Tiffin, O.
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

TIE PLATES
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.

TIES (Creosoted)
Century Wood Preserving Co., 1051 Century Bldg., Pittsburgh, Pa.

TIN PLATE
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., Mansfield, O.
National Enameling & Stamping Co., Granite City, Ill.
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.

TIN PLATE MILL EQUIPMENT
Lewis Foundry & Machine Co., Farmers Bank Bldg., Pittsburgh, Pa.

TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

TOOL BITS (High Speed)
Firth-Sterling Steel Co., McKeesport, Pa.

TOOL BITS (Stellite)
Haynes Stellite Co., 30 E. 42nd St., New York City.

TOOLS (Pneumatic)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

TOOLS (Portable Electric)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City

TORCHES AND BURNERS (Acetylene, Blow, Oxy-Acetylene)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

TORCHES AND BURNERS (Kerosene and Fuel Oil)
Hauck Mfg. Co., 114 Tenth St., Brooklyn, N. Y.

TOWERS (Transmission)
American Bridge Co., 71 Broadway, New York City.
Pacific Coast Steel Co., Rialto Bldg., San Francisco Calif.

TRACTORS (Crane)
Squier-Rix Co., 373 Broadway, Milwaukee, Wis.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Below

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Erie Steam drop Hammers can now be furnished with Timken Tapered Roller Bearings in all the joints of the valve operating mechanism. For a number of years standard hammers have been furnished with case hardened pins in reamed holes. This latest improvement, which can be furnished to order, insures that even after years of service there will be no lost motion in the valve gearing, and that the hammer will continue to be just as responsive to the movement of the treadle; that even old age will not detract from the reputation Erie Steam Drop Hammers have of being the fastest, most sensitive, and hardest hitting hammers built.

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DETROIT OFFICE
Basso Bldg.

PHILADELPHIA OFFICE
J. Charles Redmond,
Drexel Bldg.

TRAMRAILS
Cleveland Electric Tramrail, Division of the Cleveland Crane and Engineering Co., Wickliffe, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.

TRANSFORMERS (Speed)
Ganschow, Wm., Co., 24 N. Morgan St., Chicago, Ill.

TREADS (Nonslipping)
Hendrick Mfg. Co.,
43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

TREADS (Stair)
Hendrick Mfg. Co.,
43 Dundaff St., Carbondale, Pa.

TROLLEYS
Hanna Engineering Works,
1766 Elston Ave., Chicago, Ill.
Milwaukee Electric Crane & Mfg. Corp., Milwaukee, Wis.
Roeper Crane & Hoist Works,
1729 No. 10th St., Reading, Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

TRUCKS (Elevating)
Baker-Raulang Co., The, 2180 West 25th St., Cleveland, O.

TRUCKS (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

TRUCKS AND TRACTORS (Electric Industrial)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Baker-Raulang Co., The, 2180 West 25th St., Cleveland, O.

TUBE MILL MACHINERY
Mackintosh-Hemphil Co., 12th & Etna Sts., Pittsburgh, Pa.
Standard Engineering Co.,
Ellwood City, Pa.
Treadwell Engineering Co.,
Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

TUBES
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., The, Canton, O.
Tyler Tube & Pipe Co., The, Washington, Pa.

TUBES (Boiler)
Babcock & Wilcox Tube Co.,
Beaver Falls, Pa.
Bethlehem Steel Co.,
Bethlehem, Pa.
Keating, E. F., Co.,
446-54 Water St., New York City.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tyler Tube & Pipe Co., The, Washington, Pa.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

TUBES (Charcoal Iron Boiler)
Bethlehem Steel Co.,
Bethlehem, Pa.
Tyler Tube & Pipe Co., The, Washington, Pa.

TUBES (Cold Drawn Seamless Steel)
Babcock & Wilcox Tube Co.,
Beaver Falls, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Summerill Tubing Co., Bridgeport, Pa.
Timken Roller Bearing Co., The, Canton, O.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

TUBES (Lap-Welded Boiler)
Allegheny Steel Co.,
Brackenridge, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Tyler Tube & Pipe Co., The, Washington, Pa.

TUBING (Seamless or Lap-Welded)
Keating, E. F., Co., 446-54 Water St., New York City.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

TUBING (Steel)
Liberty Iron Pipe & Nipple Works, 62 Greene St., New York City.

TUMBLING BARREL EQUIPMENT
Sly, W. W., Mfg. Co., 4700 Train Ave., Cleveland, O.

TURBINES (Steam)
Allis-Chalmers Mfg. Co.,
Milwaukee, Wis.
General Electric Co.,
Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TURBO BLOWERS—See BLOWERS

TURNBUCKLES
Merrill Brothers, Maspeth, N. Y.

TURNTABLES
American Bridge Co., 71 Broadway, New York City.

TUYERES
Climax Fire Brick Co.,
Climax, Pa.
Keystone Bronze Co., 29th St., Pittsburgh, Pa.
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

TWIST DRILLS — See DRILLS

UNIONS (Pipe)
Dart, E. M., Mfg. Co.,
Providence, R. I.
Illinois Malleable Iron Co., 1801 Diversey Blvd., Chicago, Ill.

VALVES (Acid Resisting)
Duriron Co., Inc., The,
Dayton, Ohio.

VALVES (Back Pressure)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

VALVES (Blast Furnace, Copper)
Lawrenceville Bronze Co., 518 Bessemer Bldg., Pittsburgh, Pa.

VALVES (Gas and Air Reversing)
Duff Patents Co., Inc., 321 Union Trust Bldg., Pittsburgh, Pa.
McKee, Willis, 2422 Euclid Ave., Cleveland, O.
Morgan Construction Co.,
Worcester, Mass.

VALVES (Hydraulic)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

VALVES (Pneumatic)
Cleveland Pneumatic Tool Co.,
3734 E. 78th St., Cleveland, O.

VALVES AND FITTINGS
Jarecki Mfg. Co., Erie, Pa.
Jenkins Brothers, 80 White St., New York City.
Pittsburgh Valve Fdry. & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.

VANADIUM
Vanadium Corp. of America,
120 Broadway, New York City.

VIADUCTS (Steel)—See BRIDGES BUILDINGS AND VIADUCTS

VISES
Jarecki Mfg. Co., Erie, Pa.

WALK WAYS (Open Steel)
Irving Iron Works, Long Island City, N. Y.

WAREHOUSES (Iron and Steel)
Bliss & Laughlin, Inc., Harvey, Ill.
Hawkridge Bros.,
303 Congress St., Boston, Mass.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Union Drawn Steel Co., Beaver Falls, Pa.

WASHERS (Iron and Steel)
Bethlehem Steel Co.,
Bethlehem, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.

WASHERS (Leather)
Chicago Rawhide Mfg. Co., 1305 Elston Ave., Chicago, Ill.

WASHERS (Wrought)
Joliet Wrought Washer Co.,
Joliet, Ill.

WASHING MATERIAL (Rags)
Ford, The J. B., Co.,
Wyandotte, Mich.

WATER SYSTEMS
Myers, F. E., & Brother Co., The, Ashland, Ohio.

WAX (Core Wire, Pattern, Vent)
United Compound Co.,
228 Elk St., Buffalo, N. Y.

WELDING AND CUTTING APPARATUS (Electric Arc)
Agnew Electric Welder Co., The, Milford, Mich.
General Electric Co., Schenectady, N. Y.
Lincoln Electric Co., The, Coit Rd. & Kirby Ave., Cleveland, O.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.
Wilson Welder & Metals Co., Wilson Bldg., Hoboken Factory Terminal, Hoboken, N. J.

WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene)
International Oxygen Co., Newark, N. J.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

WELDING AND CUTTING (Gas)
Prest-O-Lite Co., Inc., The, 30 E. 42nd St., New York City.

WELDING APPARATUS (Spot, Butt, Seam)
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Oxweld Acetylene Co., 30 E. 42nd St., New York City.
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Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.
Wilson Welder & Metals Co., Wilson Bldg., Hoboken Factory Terminal, Hoboken, N. J.

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Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.

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Lansing, Mich.

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Interstate Iron & Steel Co., 104 So. Michigan Ave., Chicago, Ill.
Washburn Wire Co., Inc., 118th and Harlem River, New York City.

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Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.

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Pittsburgh Steel Co., P. O. Box 72, Pittsburgh, Pa.
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Vaughn Machinery Co., The Cuyahoga Falls, O.

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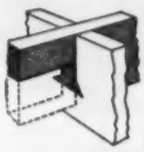

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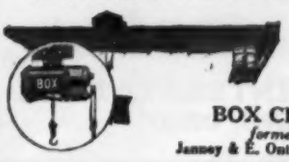

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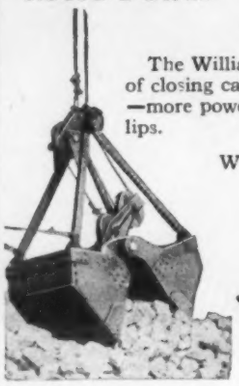

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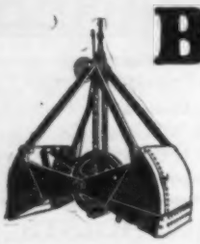

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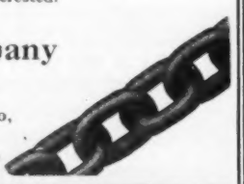

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25	. . . . .	175 tons
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1	. . . . .	250 tons
1	. . . . .	275 tons
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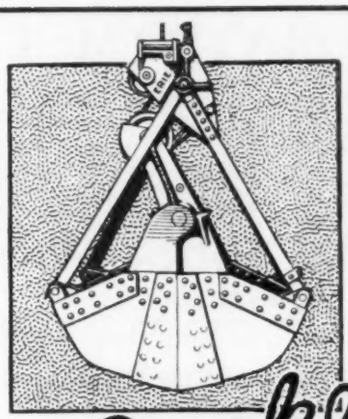

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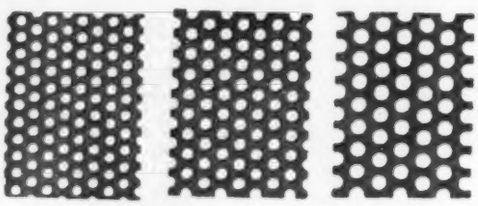

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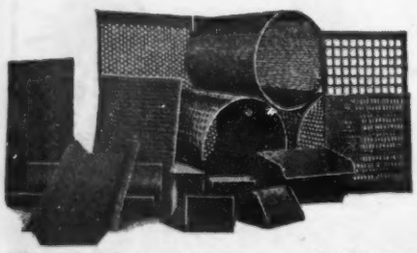

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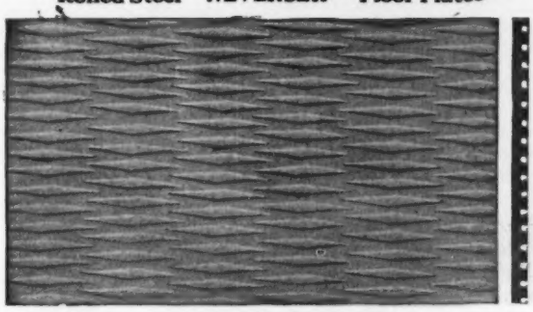

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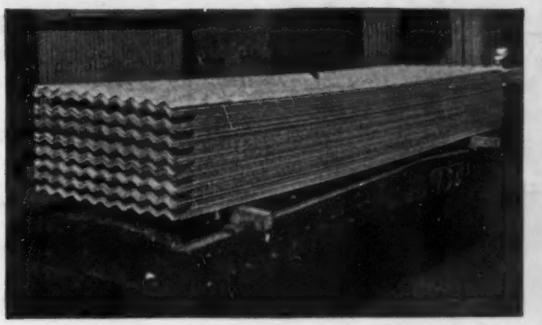

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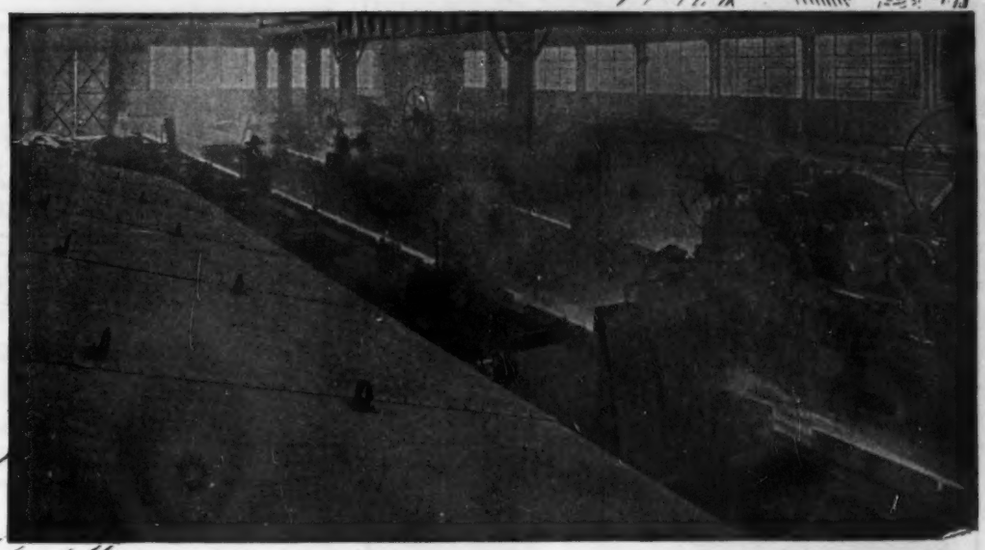

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Hot and Cold Rolled

Superior Steel Corporation

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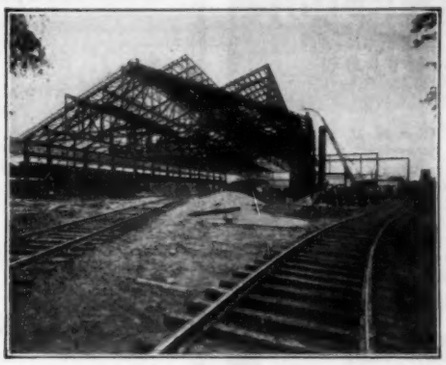

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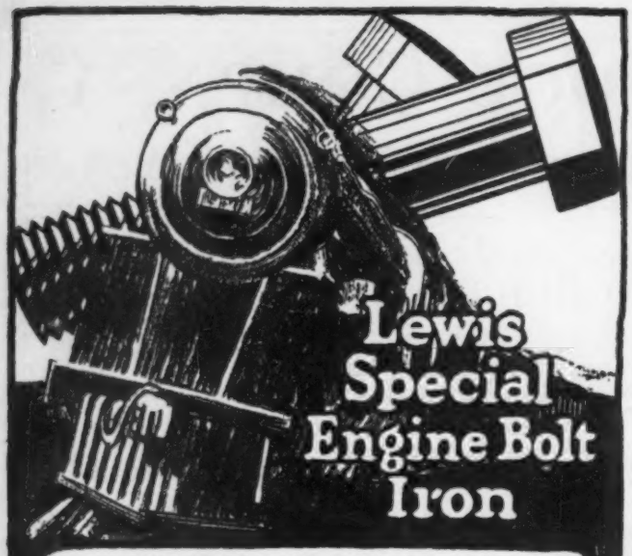

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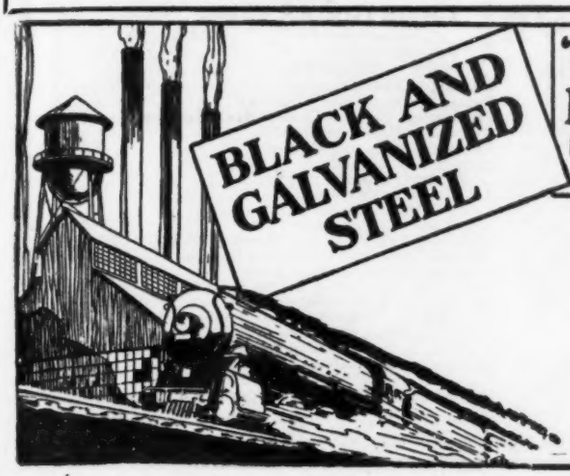

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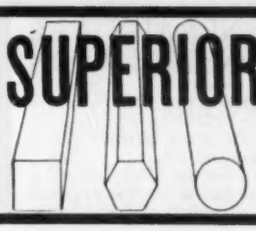

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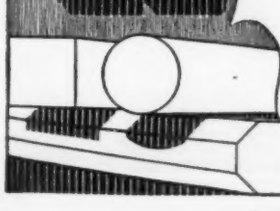

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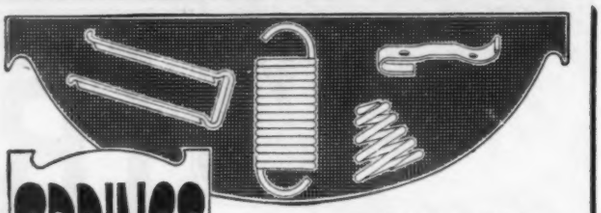

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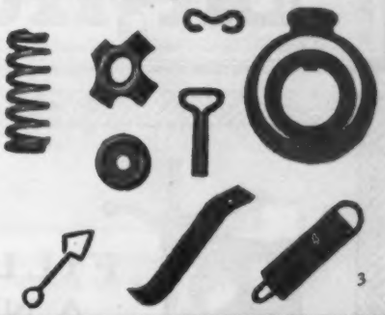

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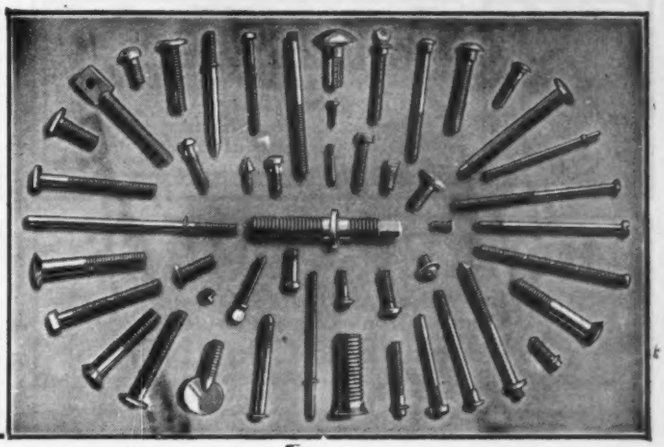

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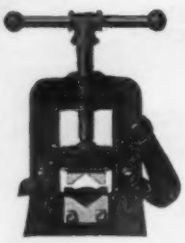

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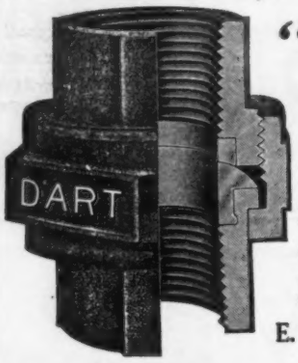

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IRON TRADE REVIEW

Resale Equipment News

Current Announcements and News of Plant Liquidations, Public Auctions of Equipment, Proposals, Bids, Sales, Etc.

December 30, 1926

AUCTION sale will be held Jan. 26-27 by Herbert Segal, auctioneer, Newark, N. J., of 1500 items of machinery and equipment at the plant of the Bock Ball Bearing Co., Toledo, O., which was bought recently by the Timken Roller Bearing Co. The machinery offered in this sale is of wide variety and is attracting much interest.

* * *

Machinery and equipment of the Superior Die, Tool & Engineering Co., Michigan City, Ind., was sold at auction Dec. 9. The Peoples Trust & Savings bank was receiver and the sale was made by order of the court. Buyers from Michigan City and Chicago took most of the machinery.

* * *

Machinery and real estate of the Sizer Steel Co., Buffalo, is to be sold by McCabe & Sheeran Machinery Corp., New York. C. G. Wyatt of the latter company is in charge of the sale at the plant. The offerings include engine and geared head lathes, planer, steam forging presses, manipulator, five steam hammers and two 10-ton electric furnaces.

Earnings Steady, While Employment Gains

Average hourly earnings of wage earners in 25 manufacturing industries were 56.5 cents in October, the same as in September, according to the National Industrial Conference board. This is 131 per cent higher than they were in July, 1914, and above any figure since late in 1920. Sixteen of 25 industries reported an advance in October, but decreases occurred in electrical apparatus manufacture, boot and shoe, leather tanning, paper and pulp industries. Average weekly earnings made a slight advance, from $27.38 in September to $27.43 in October.

Employment increased slightly over the two months. Employment in the months of 1926 has been from 6.1 to 8 per cent higher than in the comparable period of 1925. With employment in June, 1920, representing 100, the index figures for the iron and steel industry were 75 in January, 1926, increasing to 77.6 in October. The index for foundry and machine shop employment in October was 79.7, for agricultural implements 75.2, for automobiles 89.7 and for electrical apparatus 98.4.

Sales Calendar

Jan. 18—Liquidation of real estate and equipment of Kilburn-Lincoln Machine Co., Fall River, Mass.

Jan. 26-27—Auction sale of equipment in plant of Bock Ball Bearing Co., Toledo, O., recently bought by Timken Roller Bearing Co.

British Exports Down, Imports Heavy

Birmingham, Eng., Dec. 18.—(*European Staff Service*)—The British board of trade's return in November shows a total export of iron and steel products, including scrap, of 173,394 tons, compared with 196,597 tons in October and 335,237 tons in November last year.

Imports, including scrap, amounted to 429,421 tons compared with 406,871 tons in October and 221,247 in November last year.

In the export section forge and foundry iron totaled only 3756 tons against 40,360 in the same month last year. Ferroalloys totaling 4423 tons compare with 3800 in the same month last year, the amounts being divided chiefly between the United States of America, which bought 1920 tons, and Belgium, receiving 1390 tons. The total of bars, rods, angles, shapes is almost exactly that of October. There are great reductions under the heads of plates, railway rails, railway material, etc. Galvanized sheets make the best total at 47,924 tons, a reduction of 12,000 tons on the previous month.

Import figures show heavy purchases from abroad, forge and foundry iron totaling 55,810 tons against 45,298 in October. Basic increased from 12,170 tons to 19,640 tons. Billets were 75,218 tons, compared with 90,048 in the previous month. Steel bars, however, increased from 86,360 tons to 91,330 tons. Plates and sheets reached the large total of 39,391, against 32,864 in October. All these figures show large increases on those of a year ago. Taking the eleven months importation of billets was 750,730 tons, against 591,841 tons and of steel bars 609,102, against 454,128 for the same period of last year.

Exports of coke and manufactured fuel reached the trifling total of 18 tons against 382,480 a year ago. Coke, however, appears on the other side of the account, having been imported to the amount of 407,836 tons, against 200 tons in the same month last year. The coal export business approached extinction, the total sent away being 5111 tons, against 4,337,768 tons in the same month last year. Coal, however, made a respectable showing on the import side, the amount being 3,467,921 tons, as compared with 1532 tons in the same month last year. The details of origin are not shown.

General exports were valued at £53,063,647, compared with £53,176,663 in October and £60,977,357 in November last year.

The value of general imports was £113,293,397, compared with £111,013,703 in October and £114,595,037 in November last year.

The name George M. Humphrey has been given a 600-foot steel cargo carrier being built at Lorain, O. yards of the American Shipbuilding Co. for the Kinsman Transit Co., Cleveland. Mr. Humphrey is executive vice president of the M. A. Hanna Co., with extensive iron ore and coal mine, vessel and pig iron interests.

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No. 1½ Bliss Toggle Press.
6' Prentice Radial Drill, S.P.D.
66" Allen Riveter, 1¼" rivet.
50 lb. Mayer Upright Power Hammer, B.D.
200 lb. Beaudry Hammer, Belt Drive.
12" Jarecki Pipe Machine, Belt Drive.
20" Cincinnati Back Geared Crank Shaper, B.D.
10 x 10" Ingersoll Air Compressor, 150 c.f., B.D.
10' Cincinnati Squaring Shear. Capacity ¼".
7' United Squaring Shear. Capacity ¼".
36" Cincinnati Squaring Shear. Capacity ⅛".
United Engr., Alligator Shear, 1½" square.
P-1 Ferracute Blanking and Horning Press.
16" x 6' American Engine Lathe, Q.C.G.
72" x 60" x 18' Betts Planer, 4 Hds., ⅛-D.
United Engr. Straightening Rolls, Cap. 12 ga.
No. 4 H. & J. Hor. Bender and Straightener.
300-ton N.-B.-P. Hyd. Wheel Press. 48" bet. bars.

FITZSIMMONS & COLE

MACHINERY COMPANY
1208 House Bldg. **PITTSBURGH, PA.**

BORING MILLS

Three Niles Horizontal Boring, Drilling and Milling Machines

Sizes:

8 ft. vertical; 8 ft. horizontal; 6½ in. spindle; 48 in. feed.

6 ft. vertical; 8 ft. 6 in. horizontal; 4½ in. spindle; 36 in. feed.

5 ft. vertical; 5 ft. horizontal; 4½ in. spindle; 30 in. feed.

Condition.....excellent

Price.....right

Address Box 923
IRON TRADE REVIEW
Cleveland

MOTORS

Three Phase, 60 Cycle.

Quan.	Make	H.P.	Type	Volt	Speed
1	G.E.	7½	KT	440	1200
2*	G.E.	7½	1-8 Form M	440	900
25	A.C.	7½	13 D-117-613 IV	440	1200
1*	G.E.	15	1-10 Form M	440	720
1*	G.E.	15	I Form M	220	900
15	West	30	CS	440	1200
1	A.C.	15	17K18	440	800
3	G.E.	30	KT332 Form B	440	1200
2*x	West	40	CW	440	1200
1*x	G.E.	40	MT 356Y	440	1200
15*x	G.E.	40	MT 336Y	440	1200
1	West	75	CS	440	1800
6	G.E.	75	I	440	720
1	West	150	CS 179274B	2200	1800
1	G.E.	300	I Form K	2200	1200

Above motors squirrel cage with exception of those marked *, which are slip ring. Motors marked *x are vertical.

Starting compensator having no voltage release and overload relays furnished with motors 7½ H.P. and above. Controls and resistance furnished with slip ring motors. Automatic remote control with 40 and 50 H.P. slip ring motors.

NASHVILLE INDUSTRIAL CORPORATION
Old Hickory, Tennessee.

MOTOR GENERATOR UNITS

1—50 KW Synchronous M-G Set consisting of
1—75 KW G. E. Synchronous motor, 3 phase, 25 cycle, 550 volt, 715 r.p.m. direct connected to
50 KW G. E. type RC generator, 250 volt, D.C., 715 rpm. Exciter is direct connected..... $1100.00

1—50 KW Motor Generator Set consisting of
1—75 H.P. G. E. type I-K motor, 3 phase, 25 cycle, 550 volt, 1455 rpm., direct connected to a
50 KW G.E. type RMC generator, 250 volt, 1500 rpm..... $700.00

1—75 KW Synchronous M-G Set consisting of
1—Western Electric synchronous motor, 3 phase, 60 cycle, 220/440 volt, 900 rpm. direct connected to
75 KW Rebuilt Allis Chalmers Generator 250 volt, DC, 900 rpm. Exciter is direct connected..... $1150.00

Prices quoted f.o.b. Philadelphia, and include starting compensators for the motors and field rheostats for generators. Apparatus carries our standard one year guarantee.

R. SCHEINERT COMPANY

123-125 N. Third St. **Philadelphia**

AIR COMPRESSOR

830 cu. ft. 18" x 12" x 12" UNION Horizontal Duplex 2-Stage Belt Driven Air Compressor. Late type with plate valves and enclosed splash oiling frame. Complete with 150 H. P. slipring motor with controllers and drum starter.

Practically new.

MILES MACHINERY CO.
Saginaw, W. S. Mich.

For Sale
Two Brand New
CONTINUOUS
FURNACES

Complete with pushers and conveyors, $2,000.00 each. Bargain for quick sale.

Goodman & Wolfe
Terre Haute, Ind.

BLAST FURNACE

1—13 x 65' Blast Furnace, 11' dia. at hearth, 9' dia. at back, 7'6" dia. at bell with 11' dia. 24" high 2" steel hearth jacket, 1 steel bosh band, mantle ring, 6 15" x 14' cast iron columns, 2" metal, and 11' steel bell hopper platform, and steam operating mechanism distributor, including all fittings. Steam operated stopper or cannon with crane and locking bar. Operating device for plug and bell. Firebrick, etc., Equipment includes 3—18' dia. x 60' high, ⅝" steel Whitwell 4-pass hot blast stoves with blast and gas valves, with 1—4'6" dia. x 12' gas washer, ¾" plate and 1—6' dia. x 7' gas drier, ¾" plate to each furnace. Also downcomer and all connecting pipe. 1—No. 91 Columbus Vertical Steam blowing engine, size 40 x 48 x 84". 1—Weimer Vertical Steam Blowing Engine, size 40 x 48 x 60". 1—Pair Otis Engine Driven Elevators 7' x 9' oak platforms, 65' traverse, 1" cable, with 8 x 10" twin cylinder reversing hoisting engine direct geared to 48 x 23" cast iron flanged drum, also 11' x 20' elevator house with 75' bridge built up of structural steel.

Are dismantling this equipment and will sell all or any part.

NASHVILLE INDUSTRIAL CORPORATION
Old Hickory, Tennessee

Motor Driven
AIR COMPRESSOR
Immediate Delivery

Ingersoll Rand latest Type Class PRE-2, 2693 cu. ft. capacity 100 lb. pressure, direct connected to Westinghouse 2 or 3 phase 60 cycle, 2300 volt Synchronous Motor. Complete in every detail. Excellent condition. Special price for quick sale.

PITTSBURGH PNEUMATIC MACHINERY CO.
507 Liberty St. Pittsburgh, Pa.

WATER SOFTENER

Sorge-Cochrane Hot Process, 10000 gallons capacity, about six years old, good condition. Low price for quick sale.

HENRY POTTS & CO.
1610 Bankers Trust Bldg. Philadelphia

STEEL SHEET PILING

Rented—Sold—Bought
Pile Hammers Rented

WEMLINGER, INC.
149 Broadway, New York

ROOTS ROTARY BLOWERS

1—No. 3 Roots Rotary High Pressure Blower, with displacement of 2¾ cu. ft. per revolution. Excellent condition.

NASHVILLE INDUSTRIAL CORPORATION
Old Hickory, Tennessee

Opportunities

Advertisements in this section are referred to by those seeking plants and plant sites, miscellaneous semi-finished and finished raw materials; by those who desire agencies.

Advertising Rates: 1" One Time $5.00; 2" One Time $9.50; 3" One Time $14.00; 4" One Time $18.00

NEWARK, N. J.
FOUNDRY
FOR SALE

Main Building Brick Steel. 125 x 550, P.R.R. side Tracks; Traveling Cranes; Cupola capacity 100 tons. Main Building suitable for Structural steel plant; and can be sold separately.

DAVID HOUSTON, BOND & CO., Inc.
Military Pk. Bldg., 60 Park Place, Newark, N. J.

WANTED—

Medium or Heavy Machinery to Manufacture

We want something running $100,000 to $500,000 in Annual Sales.

ADDRESS P. O. BOX 730
Springfield, Ohio

For Sale or Lease
FULLY EQUIPPED FOUNDRY

Nearly new. Located on trackage five railroads. Low electric power rates. Address P. O. Box 455, Hastings, Neb.

ALL NEW—VERY CHEAP
IMMEDIATE DELIVERY

1—**Screw Machine,** Bardons & Oliver, 1" cap.
1—**Steam Engine,** 250 HP., compound, cond.
2—**Locomotives,** steam, "American", std. gauge, oil and coal burners.
2—**Locomotives,** steam, "American", 36" gauge, oil and coal burners.
Pumps, Lighting Plants, Reilly Feed Water Heaters.

R. POLIAKOFF 709 Sixth Avenue, New York City

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FACTORIES
IN THE CENTRAL STATES

Excellent locations with low labor costs. Foundries, Machine Shops and Plants with or without equipment for sale or lease. Free industrial sites to responsible manufacturers, with buildings erected and financed. Write us your requirements.

FANTUS FACTORY LOCATING SERVICE
1325 South Oakley Ave., Chicago

FOR SALE OR LEASE
In whole or part
COMPLETE MANUFACTURING PLANT
Located in Cleveland District Comprising

Tool Room 45 x 100 ft., with latest equipment including 7 lathes, 3 milling machines, grinders, radial and other drills, planer and shaper.

Machine Shop 50 x 150 ft. equipped with 10 2-spindle J & L machines, Fay automatics, drill presses, grinders, etc.

Forge Shop 40 x 120 ft. with heat treating furnaces and 80,000 gal. oil storage capacity.

This is located in ideal labor market and includes one and one half acres real estate.

Address Box 914, IRON TRADE REVIEW, Cleveland.

RAILS AND TRACK EQUIPMENT

Rails—all sections—New and Relaying. Also Frogs and Switches, Bridge Girders, I-Beams, Portable Track. Old and New Mine and Industrial Cars of various gauges in stock for immediate shipment.

M K. FRANK
Park Row Bldg., New York, N. Y. **Union Trust Bldg., Pittsburgh, Pa.**

SPECIALISTS IN
FACTORIES
FOR SALE OR LEASE

Have professional engineers with extensive plant experience who can therefore appreciate your requirements, aid you in locating a suitable factory or manufacturing industry.

TECHNICAL SERVICE COMPANY
233 Broadway, N. Y. C. Whitehall 8412

Sound advertising is successful salesmanship

Employment

POSITIONS OFFERED Minimum ad., 50 words, $3.00 Additional words, $.06 each

When a box address is desired count seven words in addition to your copy

POSITIONS WANTED Minimum ad., 30 words, $1.00 Additional words, $.03

Positions Offered

DRAFTSMEN

Experienced on rolling mill designing and checking. Permanent employment for first class men. Apply:

MESTA MACHINE COMPANY,
Pittsburgh, Pa.

THE BEST WAY TO GET A GOOD POsition in drafting or engineering is to file application direct with some of our clients who are depending on us to get competent and experienced applicants for their vacant positions. Send stamp for blank and list of vacant positions. The Cleveland Engineering Agency Co., Rose building, Cleveland, O.

IF YOU ARE OPEN TO OVERTURES for new connection, and qualified for a salary between $2500 and $25,000, your reponse to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established sixteen years. Send only name and address for details. R. W. Bixby, Inc., 110 Downtown Building, Buffalo, New York.

WANTED: CAPABLE, ENERGETIC ENGINEER. To take charge of STRUCTURAL SHOP in Pittsburgh District. Must have had experience in operation, be conversant with general shop practice and familiar with costs. Only such applications will receive consideration. State age, qualifications, references and salary desired. All information considered strictly confidential. Address Box 926, IRON TRADE REVIEW, Oliver Building, Pittsburgh, Pa.

WANTED:—YOUNG MEN TO BECOME service experts and maintenance men for high grade mechanical and electrical equipment as used in large industrial plants and factories in electrically controlling and recording temperature and pressure. Excellent opportunities for promotion after thorough course of training in factory of large manufacturer of instruments and controllers. In applying describe mechanical ability, previous experience if any and education. Young single men preferred who are free for quick transfers. Address Box 915, IRON TRADE REVIEW, Cleveland.

Positions Offered

SALESMEN WANTED

In New England, Chicago, and Detroit, to handle on a commission basis, chipping chisels and other tools for use in connection with pneumatic hammers. These tools are well established. Good opportunity for the right men. In reply give sales experience and territory desired. All communications held confidential. Address Box 931, IRON TRADE REVIEW, Cleveland.

SUPERINTENDENTS, EXECUTIVES, ENgineers, $3000-$25,000, find our individual, confidential Service effective in making desired connections. Personally planned by JACOB PENN, the eminent employment authority, known to leading metal-trades men. Not agency. Jacob Penn, Incorporated, 305 Broadway, New York.

TOOL STEEL SALESMAN
THOROUGHLY EXPERIENCED

Wanted by Tool Steel manufacturer for Philadelphia and vicinity. State experience and salary expected. Address Box 925, IRON TRADE REVIEW, Cleveland.

WANTED—PATTERN SHOP FOREMAN for Malleable Shop in Ohio. Steady, with good future for capable man. Advise regarding ability, experience, character and ambitions for future. Address Box 927, IRON TRADE REVIEW, Cleveland.

STEEL CASTINGS SALESMAN WANTED for acid open hearth steel foundry. Location Central States. Give full details age, experience, present position and salary expected. Address Box 929, IRON TRADE REVIEW, Cleveland.

WANTED:—SHOP FOREMAN FOR SMALL ornamental iron shop in Northwestern Ohio. Must be experienced in all lines of trade and be able to handle men efficiently. Address Box 930, IRON TRADE REVIEW, Cleveland.

Positions Wanted

BUYER

Young man, age thirty-two, desires position as buyer, follow-up man or storekeeper. Six years automotive experience. Best of reference. Address Box 924, IRON TRADE REVIEW, Cleveland.

SALES AGENCY

Commission basis only, on structural rivets or kindred line to sell New England structural and ornamental trade. Already established and intensive representation guaranteed. Address Box 917, IRON TRADE REVIEW, Old South Building, Boston, Mass.

BLAST FURNACE SUPERINTENDENT wishes to communicate with a company which needs a successful furnace man. Address Box 903, IRON TRADE REVIEW, Cleveland.

COMPTROLLER OR WORKS MANAGER:— Man with energy, executive ability and experience as industrial engineer, comptroller, general superintendent, assistant to president, purchasing, scheduling, organizing, operating, securing and holding cooperation. Now employed, desires location New England or Eastern states. Address Box 921, IRON TRADE REVIEW, Cleveland.

TANK AND STEEL PLATE CONSTRUCtion man, long experience and mature judgment in above lines. Competent estimator, successful salesman, seeks position as manager or sales manager with well equipped plant. Address Box 920, IRON TRADE REVIEW, Cleveland.

FOUNDRYMAN
WANTS POSITION

As foreman or assistant, where uniformity and low cost is required, light to medium weight gray iron machinery castings. Twenty-five years experience with modern foundry methods. Can mix by analysis for any output. Central states preferred. Address Box 922, IRON TRADE REVIEW, Cleveland.

Fill-in and Contract Work

CASTINGS — FORGINGS — STAMPINGS — PATTERNS
MACHINE PRODUCTS — DIES, JIGS, FIXTURES and TOOLS

The Foundation of Business—

Business like a skyscraper must have a foundation that can stand the strain of unexpected conditions. In the case of the skyscraper the foundation is formed by manual labor and working materials.

But in business this foundation is formed by successfully planned advertising. It must be arranged in such a way that it can withstand the shock of business conditions.

What do we find as a safeguard against unemployed labor, and idle machinery and equipment? — CLASSIFIED ADVERTISING.

From time to time use this type of advertising as the occasion presents itself. Protect yourself constantly against any slight business fluctuations by using our Fill-in and Contract Work Section.

IRON TRADE REVIEW

OTTUMWA IRON WORKS
OTTUMWA, IOWA
Solicits your inquiries for Light and Heavy Gray Iron Castings and Light and Heavy Machine Work, spur gears, rolling mill machinery, etc. Send us your blue prints and specifications and we will be pleased to submit bids.
Engineers Founders Machinists

HOT DIP GALVANIZING
We have the largest hot dip job galvanizing plant and kettles in the United States.
We have the most modern equipment to do first class galvanizing at lowest prices. Galvanized Products Furnished.
Prime Western Zinc used exclusively.
Send us your inquiries
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Contract manufacturing of sheet steel and light structural steel work. Send us prints.
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Get your copy now.
The Penton Publishing Co.
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Cleveland, Ohio
Price $10.00 postpaid.

Opportunity knocks . . . but don't wait for her to open the door

Fill-in and Contract Work

CASTINGS — FORGINGS — STAMPINGS — PATTERNS
MACHINE PRODUCTS — DIES, JIGS, FIXTURES and TOOLS

CASTINGS

CONNECTICUT

NELSECO FOUNDRY, New London. Gray iron; 10% steel, 5 lbs. to 10 tons. Superior steel castings up to 2,000 lbs. Machine work.

THE SESSIONS FOUNDRY CO., INC., Bristol. Gray iron from smallest to thirty tons. Pattern and machine shop.

I. S. SPENCER'S SONS, INC., Guilford. Gray iron, brass and bronze castings, machined, japanned or plated. Screw machine products.

DELAWARE

DEEMER STEEL CASTINGS CO., Washington Boulevard, New Castle. Small and medium size steel castings.

HILLES & JONES WORKS, Wilmington. Gray iron and semi-steel castings up to 70 tons. Also machine and pattern shop.

ILLINOIS

CHICAGO STEEL FOUNDRY CO., Chicago, Kedzie Ave. & 37th St. Electric furnace steel castings of the highest quality.

ILLINOIS FOUNDRY CO., Springfield. Light and medium gray iron and semi-steel castings, Pattern shop.

A. PLAMONDON MFG. CO., Chicago, 5301 South Western Blvd. Gray iron castings. Machine and pattern shop.

WANNER MALLEABLE CASTINGS CO., Certified Malleable Castings. Carefully finished. Pattern Shop. Works, Hammond, Ind.; Beloit, Wis.

INDIANA

HUBBARD STEEL FOUNDRY CO., East Chicago. Steel castings up to 100,000 lbs. sand iron and chilled iron rolls.

KENDALLVILLE FOUNDRY CO., Kendallville. Can fill orders from patterns to completed castings in gray iron, semi-steel, brass, bronze and aluminum.

MARION MACHINE, FOUNDRY & SUPPLY CO., Marion. Gray iron, semi-steel up to 20,000 lbs. Building specialties; pattern and machine work.

RELIANCE FOUNDRY CO., Richmond. High quality gray iron and semi-steel castings, one to five tons. Let us quote you prices.

WANNER MALLEABLE CASTINGS CO., Certified Malleable Castings. Carefully finished. Pattern Shop. Works, Hammond, Ind.; Beloit, Wis.

IOWA

CENTRAL FOUNDRY CO., Marshalltown Light and medium gray iron. Pistons and auto acces. B & B Sanitary Heated Stock Fountains.

DAVENPORT MACHINE & FOUNDRY CO., Davenport. Heavy gray iron and semi-steel to ten tons. Mfgrs. of "Davenport" Molding Machines.

KENTUCKY

THE DRUMMOND MANUFACTURING CO., Louisville, 1214 West Main St. Gray iron, semi-steel castings. Production work desired. Quick shipments.

CASTINGS

MICHIGAN

AUTO SPECIALTIES MFG. CO., St. Joseph. Highest grade malleable castings, either plain or machined, and finished to blue print.

BLACKMER PUMP CO., Grand Rapids, solicits orders for high grade castings in iron or bronze, light and medium weight. Prompt delivery.

ENTERPRISE BRASS WORKS, Muskegon. Bronze and aluminum castings. Plumbers brass goods.

LAKE SHORE ENGINE WORKS. Marquette. Gray iron castings up to fifteen tons. Pattern shop and machine shop.

MISSOURI

A. GILBERT & SONS BRASS FOUNDRY CO. St. Louis. Castings in brass, bronze and aluminum. Patterns, finishing, babbitt metal solder.

NEW HAMPSHIRE

EXETER BRASS WORKS, Exeter. Brass and bronze castings, machining and nickel plating. Estimates given from sample or blue prints.

NEW JERSEY

WEST BERGEN IRON FOUNDRY, Jersey City, 21-27 Pollock Ave. Soft gray iron castings up to 5 tons each.

NEW YORK

ACME STEEL & MALLEABLE IRON WORKS INC., Buffalo. High grade malleable, gray iron and open hearth steel.

BUFFALO FOUNDRY & MACHINE CO., Buffalo. Gray iron, semi-steel and special mixture castings, 1 to 200 tons. Pattern and machine shop.

FARRAR & TREFTS, INC., Buffalo, 67 Perry St. Gray iron, 1 lb. to 50 tons. Semi-steel, chemical and chilled castings. Manholes and grates.

FRONTIER BRONZE CORP., Niagara Falls. Titanium, aluminum, bronze, copper, aluminum, brass castings. Bronze bushings in stock.

MARCY FOUNDRY CO., New York, 74 Beekman St. Light gray iron castings; machining facilities. Foundry at Perth Amboy, N. J.

METAL & ALLOY SPECIALTIES CO., INC., Buffalo. Brass, bronze, aluminum, monel metal, copper, nickel bronze. Pattern, mach. shop.

NAYLOR BROS., Peekskill. Gray iron up to 4 tons. Machine and pattern shop. Pulley castings and hangers. Daily boat service to New York City.

SHERWOOD MFG. CO., Buffalo, 1701 Elmwood Ave. Brass and bronze castings to your specifications. Complete machining facilities.

SWEET & DOYLE FDRY. & MCH. CO., Troy, Green Island. Med. and hvy. gray iron mchy. castings up to 10 tons. Pattern, machine, engineering shops.

A. L. SWETT IRON WORKS, Medina. Plumbers specialties, street castings and general gray iron castings. Machine work. Specialties.

CASTINGS

OHIO

THE AMERICAN CRUCIBLE PRODUCTS CO., Lorain. Brass, bronze and aluminum castings. Machined parts. Mill brasses a specialty.

THE CINCINNATI STEEL CASTINGS CO., Cincinnati. Queen City and Spring Grove Aves. Electric process steel castings only.

THE COMMERCIAL STEEL CASTINGS CO., Marion. Acid open hearth steel castings 5 lbs. to 10 tons. Shipping facilities on five railroads.

CRUCIBLE STEEL CASTING CO., Cleveland. Electric steel castings. Specialize in nickel-chrome alloys for abrasive wear and high ultimates.

THE EBERHARD MFG. CO., Cleveland, 2734 Tennyson Rd. Light malleable iron castings for automobile and general purposes.

THE G. & C. FOUNDRY CO., Sandusky. Light and medium weight soft gray iron and semi-steel castings.

THE MACHINED STEEL CASTING CO., Alliance. Acid open hearth steel castings, 1 lb. to 100,000 lbs. each. Castings machined if desired.

THE SPRINGFIELD ALUMINUM PLATE & CASTINGS CO., Springfield. Aluminum castings and match plates. First class work.

THE WEST STEEL CASTING CO., Cleveland. High grade light work steel castings, 1 to 500 lbs. Quality work desired. Qual. and service guaranteed.

PENNSYLVANIA

AMERICAN ENGINEERING CO., Philadelphia Aramingo & Cumberland Sts. Gray iron and semi-steel from 1 to 24,000 lbs. Long and varied experience.

DAVIES & THOMAS CO., Catasauqua, (N. Y. Office, 342 Madison Ave.) Gray iron up to 10,000 lbs. Complete machine and pattern shops.

FORT PITT STEEL CASTING CO., McKeesport. Specializing in accurate, uniform electric steel castings of every description.

GRAY IRON FOUNDRY CO., Reading. Specializing on small castings of every description. Machining or hand molded, tumbled or sand blasted.

JOHNSON BRONZE CO., New Castle. Brass and bronze castings, both machined and finished. From ½ lb. to 100 lbs. finished; ½ lb. to 1000 lbs. rough.

KENNETT FOUNDRY & MACHINE CO., Kennett Square. Chilled and gray iron castings, light and up to 5 tons. Machine, pattern shops.

KUEBLER FOUNDRIES, INC., The, Easton. Refined Malleable Iron Castings, every description. Motor Truck, Auto, Railway Car, Trackwork.

McGANN MFG. CO., INC., York, Box 326. Gray iron and semi-steel castings up to 15,000 lbs. Dryers, lime kilns, hydrators, complete equipment.

MARION MACHINE, FOUNDRY & SUPPLY CO., Scottdale. Gray iron, semi-steel, up to 20,000 lbs. Building specialties; pattern, machine work.

MEADVILLE MALLEABLE IRON CO., Meadville. High grade malleable castings from refined air furnace iron. Pattern and machine shop.

NATIONAL FOUNDRY CO., Erie. Steel castings of all descriptions. Patterns and machine shop in connection.

Fill-in and Contract Work

CASTINGS — FORGINGS — STAMPINGS — PATTERNS
MACHINE PRODUCTS — DIES, JIGS, FIXTURES and TOOLS

CASTINGS

PENNSYLVANIA

NAZARETH FOUNDRY & MACHINE CO., Nazareth (Eastern Penna.) Gray iron castings, brass castings. Complete machine and pattern shops.

NORTH WALES MACHINE CO., INC., North Wales. Gray iron, superior quality machine or hand molded, sand blasted, pickled or tumbled.

READING STEEL CASTING CO., Reading. Electric and open hearth steel castings, 1 lb. to 20 tons.

THE SHOOP BRONZE CO., Tarentum. Mill bearings, bushings, pickle crates, hydraulic, aluminum castings, large, small, rough or machined.

STANDARD ENGINEERING CO., Ellwood City. Heavy gray iron, semi-steel and air furnace iron castings. Pattern and machine shops.

TAYLOR-WILSON MANUFACTURING CO., McKees Rocks. Gray iron to 10 tons. Semi-steel. Machine molded gears. Machine and pattern shops.

TREADWELL ENGINEERING CO., Easton. Iron castings to 35 tons. Electric steel castings to 5,000 lbs. Complete machining facilities.

UNION SPRING & MANUFACTURING CO., New Kensington. Electric steel castings. Manganese steel castings a specialty. Alloy castings.

RHODE ISLAND

UNIVERSAL WINDING CO., Providence, 1655 Elmwood Ave. Soft gray iron; free machining; quan. production; charcoal mixture, up to 6,000 lbs.

WISCONSIN

UNIVERSAL FOUNDRY CO., Oshkosh. Gray iron, Auto, hardware, electrical machinery. Wood, metal patterns. Production match plates.

WANNER MALLEABLE CASTINGS CO., Certified Malleable Castings. Carefully finished. Pattern Shop. Works, Hammond, Ind.; Beloit, Wis.

PATTERNS

OHIO

STANDARD PATTERN WORKS CO., Cleveland. Machine cut wood and metal gear patterns. Match plates. Moulding machine equipment.

PENNSYLVANIA

STANDARD PATTERN WORKS, Erie. Wood and metal patterns of every description. Match plate work. Send us your blue prints for estimate.

STAMPINGS

CONNECTICUT

THE AMERICAN TUBE & STAMPING PLANT, The Stanley Works, Bridgeport. Stampings, forming and assembling. Modern methods and equipment.

THE KIRBY MFG. CO., Middletown. For your small metal stampings, why not come to Kirby specialists. Blanking, forming, assembling.

THE ROOT CO., Bristol. Light and medium quality stampings from steel, brass or copper. Get our quotation.

J. H. SESSIONS & SON, Bristol. Steel stampings, japanned, brass plated or tinned if desired. Material ⅛" thick or less. Light washers.

THE STANLEY WORKS, New Britain. Special Productions Department. Stanley stampings excel in quality.

THE HORACE R. WHITTIER CO., Pequabuck. Light stampings; enameling of small parts. Porcelain acid proof dials for meters, etc.

ILLINOIS

JOILET WROUGHT WASHER CO., Joliet. Standard washers and riveting burrs. Special washers. Steel stampings.

MASSACHUSETTS

LARSON TOOL & STAMPING CO., Attleboro, 501 Olive St. Medium and light stampings, all metals, complete assemblies. Single pieces or carloads.

MICHIGAN

LANSING STAMPING CO., Lansing. Heavy medium and light metal stampings. Send blue prints or samples for estimate.

OHIO

THE BELLAIRE ENAMEL CO., Bellaire. We make the dies and produce your drawings and stampings at surprising speed. Send samples.

THE CINCINNATI VICTOR CO., 712 Reading Road, Cincinnati. All kinds of quality sheet metal stampings. Send blue print or sample.

PENNSYLVANIA

CENTRAL IRON & STEEL CO., Harrisburg. Steel stampings and pressed metal parts. ⅛" and heavier. Unusual facilities. Send your specifications.

WEST VIRGINIA

ACKERMANN MANUFACTURING CO., Wheeling. Steel stampings. Specially equipped to manufacture your heavy pressed steel parts.

MACHINE PRODUCTS

CONNECTICUT

DAY-COPE CO., INC., Forestville. Screw Machine Products up to ¾" diam. Send Blue Print or Sample.

ILLINOIS

MACHINERY PRODUCTS CORP., Chicago, 152 Whiting St. Mfrs. Screw Machine Products. Cap Nuts, Knurled Nuts, in stock.

MASSACHUSETTS

WALTHAM SCREW CO., Waltham. Specialist in screw machine products.

MISSOURI

CRAGO GEAR AND MACHINE WORKS, Kansas City. Spur gears from one inch to six feet. Worms, sprockets and specials. Machine work.

FORGINGS

CONNECTICUT

COLT'S PATENT FIRE ARMS MFG. CO., Hartford. Modern equipment, long experience in drop forging. Fine machine finishing. At your service.

INDIANA

BASS FOUNDRY & MACHINE CO., Fort Wayne. Double refined hammered iron for draw bar and other severe usage. Hammered steel forgings.

PORTLAND FORGE & FOUNDRY CO., Portland. Drop forgings 4 oz. to 30 lbs. 12 board drop hammers and 1 forging machine. Machine dept.

OHIO

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Index to Advertisements

The star (*) indicates that the advertisement appears alternate weeks, the dagger (†) once a month.

A

†Abendroth & Root Mfg. Co. —
Acme Steel Co. 63
Agnew Electric Welder Co. 39
Air-Tight Steel Tank Co. 68
Akron-Selle Co. 60
†Alcumite Corporation, The —
†Allegheny Steel Co. —
Allen, Edgar, Steel Co., Inc. 65
†Allen Mfg. Co., The —
*Alliance Machine Co., The 59
Alliance Structural Co. 64
Allis-Chalmers Mfg. Co. 39
*American Adamite Co. 13
†American Brass Co., The —
American Bridge Co. 65
American Chain Co., Inc. 58
American Chemical Paint Co. 45
American Foundry Equipment Co. 45
†American Gas Association —
†American Heat Economy Bureau, Inc. —
American Kron Scale Co. —
*American Malleable Castings Association, The —
American Manganese Bronze Co. —
American Nickel Corp. 77
†American Pipe Bending Machine Co. —
American Pressed Steel Co. 61
*American Punch & Shear Works —
†American Rolling Mill Co. —
American Sheet & Tin Plate Co. 62
American Spiral Spring & Mfg. Co. 69
*American Spring & Mfg. Co. —
American Steel & Wire Co. 70
American Steel Foundries 49
†American Telephone & Telegraph Co. —
American Terry Derrick Co. 57
American Tube & Stamping Plant, The, of the Stanley Works 63
Andrews Steel Co. 67
†Apollo Steel Co. 3
†Armstrong Cork & Insulation Co. —
Ashland Fire Brick Co. 78
*Atlas Car & Mfg. Co. —
Atlas Steel Casting Co. 47
†Auer Register Co. —

B

Babcock & Wilcox Co. 68
*Babcock & Wilcox Tube Co., The —
†Baker-Raulang Co., The —
†Barnes Drill Co. —
Barnes-Gibson-Raymond, Inc. 70
†Bartlett, C. O., & Snow Co. —
*Bay City Forge Co. 53
Beardsley & Piper Co., The 11, 12
Beatty Machine & Mfg. Co. 57
Bedford Foundry & Machine Co. 57
Bellevue Industrial Furnace Co. —
Belmont Iron Works 64
Best, W. N., Corp. 41
Bethlehem Steel Co. 5
Birdsboro Steel Foundry & Machine Co. 39
Blacker Engineering Co. 41
Blaw-Knox Co. 58
*Bliss & Laughlin, Inc. —
Bliss, E. W., Co. 4
†Blystone Mfg. Co. —
†Bollinger-Andrews Construction Co. —
Boston Gear Works Sales Co. 43
†Botfield Refractories Co. —
Box Crane & Hoist Corp. 57
Bradley, C. C., & Son, Inc. 37
Brassert, H. A., & Co. 73
†Breese Brothers Co., The —
†Brighton Fire Brick Co. —
Brosius, Edgar E. 57
†Brown Hoisting Machinery Co. —
†Browning Crane Co., The 14
†Brown-Wales Co. —
*Buffalo Bronze Die Cast Corp. 51
Bultman, F. H., Co. 85

C

*Cadman, A. W., Mfg. Co. —
†California White & Sugar Pine Manufacturers Association —
*Canton Forge & Axle Co. —
†Carborundum Co. —
Carlyle-Johnson Machine Co. 37
Carnegie Steel Co. 66
†Carroll Chain Co., The —
†Cascade Foundry Co. —
Cattie, Jos. P., & Brothers 85
†Celite Products Co. —
Central Alloy Steel Corp. —
Central Iron & Steel Co. 61
Central Tube Co. 72
†Century Wood Preserving Co. —
Chambersburg Engineering Co. 39
†Champion Machine & Forging Co., The —
†Chapman Engineering Co. —
Chicago Gear & Mfg. Co. 43
Chicago Perforating Co. 61
Chicago Pneumatic Tool Co. 35
*Chicago Rawhide Mfg. Co. —
Chicago Steel Foundry Co. 47
Cincinnati Steel Castings Co., The 47
†Clark Brothers Bolt Co. —
†Clark Controller Co. —
Cleveland-Cliffs Iron Co. 75
Cleveland Electric Tramrail Division 58
Cleveland Pneumatic Tool Co. 43
*Cleveland Punch & Shear Works Co. —
*Cleveland Wire Cloth & Mfg. Co. —
Cleveland Wire Spring Co., The 76
Climax Fire Brick Co. 79
†Cold Finished Steel Bar Industry —
Columbia Steel Co. 61
*Columbia Steel Corp. (San Francisco) —
Columbia Tool Steel Co. 64
†Columbus Forge & Iron Co. —
Columbus Malleable Iron Co. 51
Combustion Engineering Corp. 73
Commercial Steel Casting Co., The 47
†Connersville Blower Co. —
Contract Work Section 85
Cook Spring Co. 70
†Cooper, C. & G., Co. —
*Copper & Brass Research Association 77
†Costello Engineering Co. —
†Cox & Sons Co., The —
Crescent Refractories Co. 78
Crosby Co. 60
Crucible Steel Casting Co. (Cleveland, O.) 47
*Curtis & Curtis Co., The 41
Cutler-Hammer Mfg. Co. —
*Cyclops Foundry Co. 49
†Cyclops Iron Works —

D

Danville Malleable Iron Co. 49
Dart, E. M., Mfg. Co. 72
Deming Co. —
Diamond Clamp & Flask Co. 45
†Donner Steel Co., Inc. —
Dover Fire Brick Co. 79
Drop Forging Co. of New York 53
†Duer Spring & Mfg. Co. —
Duff Patents Co., Inc. 72
†Duriron Corp. —

E

*Eagle Bolt & Forging Co. —
Eaton, Rhodes & Co. 74
Eccles, Richard, Co. 53
Eichleny, John, Jr., Co. 64
Electric Controller & Mfg. Co. Back Cover
†Electric Furnace Co. —
*Electro-Alloys Co. —
*Electro Metallurgical Sales Corp. —
†Elliott-Blair Steel Co. —
*Ellis, Frank I. —
Emerman, Louis E., & Co. 82
Employment Section 84
†Englehard, Charles, Inc. —
*Enterprise Brass Works —
†Era Steel Co. —
Erdle Perforating Co. 60
*Erie Foundry Co. 55
Erie Steel Construction Co. 59
Eureka Fire Brick Works 78

F

†Fairbanks Co. —
Fantus Factory Locating Service 83
†Farrel Foundry & Machine Co. —
Farrell-Cheek Steel Foundry Co. 27, Front Cover
†Fawcus Machine Co. —
†Federal Press Co. —
Federal Steel Foundry Co. 47
†Ferro Enamel Supply Co., The —
Fill-in and Contract Work Section 85
†Firth-Sterling Steel Co. —
Fitzsimmons & Cole Machinery Co. 82
*Fleming Mfg. Co. 65
Flinn & Dreffein Co. 41
†Floersheim, B., & Co. —
Ford, J. B., Co., The 45
*Forest City Foundry Mfg. Co. —
†Fort Pitt Spring & Mfg. Co. —
†Foundation Ovens Corp. —
*Frank, M. K. —
†Franklin Core Rod & Gagger Co. 64
†Franklin Steel Works —
†Freyn Engineering Co. —
Fuller-Lehigh Co. 41

G

Ganschow, Wm., Co. 43
General Electric Co. —
General Refractories Co. 78
*G G G Metal Stamping Co. 61
*Globe Iron Co. 75
Globe Wire Co. 64
Goodman & Wolfe 83
*Gray-Gregory Galvanizing Co. —
Griffin Mfg. Co. 64
Gulf States Steel Co. 70

H

Hagan, Geo. J., Co. 41
Hallden Machine Co. —
†Hammond Iron Works —
†Hanlon-Gregory Galvanizing Co. —
*Hanna, The, M. A., Co. —
Hanna Engineering Works —
Harbison-Walker Refractories Co. 79
Harnischfeger Corporation 26, 57, 58
Harrington & King Perforating Co. 60
Hauck Mfg. Co. 41
Haven Malleable Castings Co., The 49
*Haws Refractories Co. 79
Haynes-Stellite Co. —
†Hearne, William W., Inc. —
Hendrick Mfg. Co. 57, 60
Heppenstall Forge & Knife Co. 53
Hering, W. O., & Co. —
Herman Pneumatic Machine Co. 45
Hillman Coal & Coke Co. 75
Hills-McCanna Co. —
†Hindley Mfg. Co. —
†Hinman, D. A., & Co. —
Holcroft & Co. 41
Hoover Steel Ball Co. —
Houston, Bond & Co., Inc., David 83
Hubbard, M. D., Spring Co. 71
Hunter Saw & Machine Co. 39
†Hyatt Roller Bearing Co. —
†Hyde Park Foundry & Machine Co. —
*Hydraulic-Press Brick Co. 78

I

†Illinois Clay Products Co. —
Illinois Malleable Iron Co. 51
Illinois Steel Co. 66
*Illinois Steel Warehouse Co. —
*Industrial Gloves Corp. —
†Industrial Maintenance Bureau —
†Industrial Steel Casting Co. —
Ingersoll-Rand Co. 7
Inland Steel Co. 61
International Furnace Co. 41
International Nickel Co., The —
*International Oxygen Co. —
†Interstate Iron & Steel Co. —
*Iowa Malleable Iron Co. 51
Irving Iron Works Co. 69

J

†James, D. O., Mfg. Co. —
*Jarecki Mfg. Co. 72
Jenkins Brothers 72
Johnson, Carlyle, Machine Co. 37
*Joliet Wrought Washer Co. 61
Jones & Laughlin Steel Corp. —
†Jones, W. A., Foundry & Machine Co. —

K

Kalamazoo Malleable Iron Co. 51
†Kane & Roach 41
†Kardong Brothers —
*Keating, E. F., Co. 72
Kennedy, Julian 73
Keokuk Electro Metals Co. 77
Keystone Bronze Co. 51
Kidd Drawn Steel Co. 66
Kier Fire Brick Co. 79
†Kinnear Mfg. Co. —
Kirk & Blum Mfg. Co. 85
*Koppers Co. —
*Kratzer, W. N., Co. —
Kropp Forge Co. 53

L

Laclede-Christy 79
Laclede Steel Co. 63
Lake Erie Bolt & Nut Co. 69
†Lake Shore Engine Works —
Lakeside Malleable Castings Co. 49

Index to Advertisements

†Lakeside Steel Improvement Co., The —
Lamson & Sessions Co. —
†Landis Machine Co. —
*Landis Tool Co. 8
*Lansing Stamping Co. —
Latrobe Electric Steel Co. 67
Laughlin, Alex, & Co. 73
Lavino, E. J., & Co. 78
†Lawrenceville Bronze Co. —
†Leard, Wm., Co. —
Leavitt, C. W., Co. 77
Lewis Foundry & Machine Co. 43
Liberty Iron Pipe & Nipple Works 72
*Lincoln Electric Co., The 16
*Linde Air Products Co. —
Link-Belt Co.1733 (Editorial), 51
†Lockhart Iron & Steel Co. —
Logemann Brothers Co. 1731 (Editorial)
*Long & Allstatter Co. —
Lucas, J. L., & Son, Inc. 81
Ludlum Steel Co. 66

Mc

McClintic-Marshall Co. 64
McKee, Arthur G., & Co. 73
McKee, Willis 73
McMyler-Interstate Co. 58

M

*Mackintosh Engineering Co. —
†Mackintosh-Hemphill Co. —
†Mansfield Sheet & Tin Plate Co. —
Marchant, Geo. F., Co., The 39
Marion Malleable Iron Works 49
Marquette Ore Co. 74
Marr-Galbreath Machinery Co. —
Maynard Electric Steel Casting Co. 47
†Meeker Foundry Co. —
†Merrill Brothers —
*Mesta Machine Co. —
†Metal & Alloy Specialties Co., Inc. —
Metal & Thermit Corp. 77
†Midvale Co., The —
*Midwest Casting Co., The —
Miles Machinery Co. 81, 83
*Milford Mfg. Co. 70
Milwaukee Electric Crane & Mfg. Corp. 58
†Moeschl-Edwards Corrugating Co., Inc., The —
*Mohr, J. J., & Son. —
*Moline Malleable Iron Co. —
Moloch Co. —
†Moltrup Steel Products Co. —
Molybdenum Corp. of America —
Monessen Foundry & Machine Co. 51
†Monroe, W. K., Co. —
*Moore, W. E., & Co. —
Morey & Co., Inc. 81
Morgan Construction Co. 39
Morrison, J. S., Co., Inc. —
Morris Wheeler & Co., Inc. —
Morton Mfg. Co. 39
Motor Wheel Corp. —
Mott Sand Blast Mfg. Co. 45
Mount Vernon Bridge Co. 73
Mundt, Charles, & Sons. 60
†Myers, F. E., & Brother Co., The —

N

Nashville Industrial Corp. 82, 83
†National Enameling & Stamping Co., Inc. (Granite City Steel Works) —
National Engineering Co. 45
National Machinery Co. 39
National Roll & Foundry Co. 33
National Tube Co. 23
Newark Malleable Iron Works 49
*New Departure Mfg. Co., The —
Newport Rolling Mill Co. 67
Newton Steel Co. 62
†Niagara Machine & Tool Works —
Niles-Bement-Pond Co. 10
Niles, F. H., & Co., Inc. 82
†Norma-Hoffmann Bearings Corp. —
Northern Hemlock & Hardwood Manufacturers Association —
Northern Malleable Iron Co. 49
†Nugent Steel Castings Co. —

O

Ohio Electric & Controller Co. 57
*Ohio Structural Steel Co. 65
Oliver Iron & Steel Corp. 71
Opportunities Section 83
*Oriskany Malleable Iron Co., Inc. —
Orton Crane & Shovel Co. 59
Ottumwa Iron Works 85
†Oxweld Acetylene Co. Inside Back Cover

P

Pacific Coast Steel Co. 65
†Pangborn Corp. —
†Park & Williams, Inc. —
†Parker Rust-Proof Co. —
Payne, N. B., & Co. 81
†Pease, C. F., Co. —
†Peck, Stow & Wilcox Co., The —
Penn Iron & Steel Co. 66
Penn Mold & Mfg. Co. 51
Pennsylvania Engineering Works 41
Peoria Malleable Castings Co. 49
†Perin & Marshall —
*Peterson Spring Co. 70
Petroleum Iron Works Co. 68
Philadelphia Gear Works 43
Philadelphia Steel & Iron Co. 53
†Phillips & McLaren Co. —
Phoenix Bridge Co. 65
Phoenix Iron Co. 65
*Pickands Mather & Co. —
Pilling & Co. 74
Pittsburgh Coal Co. 74
†Pittsburgh Cold Rolled Steel Co. —
†Pittsburgh Crushed Steel Co. —
Pittsburgh Electric Furnace Corp. 41
†Pittsburgh Malleable Iron Co. —
Pittsburgh Pneumatic Machinery Co. 83
*Pittsburgh Rolls Corp. 33
*Pittsburgh Steel Co. 71
*Pittsburgh Tool Steel Wire Co. —
Pittsburgh Valve Foundry & Construction Co. 73
Poliakoff, R. —
Portage Silica Co. 45
†Portsmouth Refractories Co. —
Potts, Henry, & Co. 83
†Potts Manufacturing Co. —
*Power Piping Co. —
†Prest-O-Lite Co. 24
Progressive Mfg. Co. 71

Q

*Queen City Forging Co. 53
Queen's Run Refractories Co., Inc. 79
Quigley Furnace Specialties Co. 79
Quinn, Clement K., & Co. 74

R

Raymond Mfg. Co. 69
*Reliable Perforating Co. 61
†Reliance Steel Casting Co. —
*Republic Iron & Steel Co. 6
Rhode Island Tool Co. 70
†Rickert-Shafer Co. —
Riter-Conley Co. 69
†Rockford Bolt Co. —
Rockford Drop Forge Co. 53
Rockford Malleable Iron Works 49
Roebling's, John A., Sons Co. 70
Roeper Crane & Hoist Works, Inc. 58
Rogers Brown & Crocker Bros., Inc. 77
Roots, P. H. & F. M., Co. 35
*Ross-Meehan Foundries 51
*Russell, Burdsall & Ward Bolt & Nut Co. 25
Ryerson, Joseph T., & Son. 28

S

†St. Louis Coke & Iron Corp. 19
Samuel, Frank, & Co. 77
Scheinert, R., Co. 82
*Scranton Forging Co. 53
Semet-Solvay Co. —
Seneca Iron & Steel Co. 62
Sharon Foundry Co. 47
Sharon Steel Hoop Co. 62
*Sheet Steel Trade Extension Committee 21
Shepard Electric Crane & Hoist Co. 58
*Shore Instrument & Mfg. Co., The —
*Shover, Barton R. —
Shuster, F. B., Co., The 33
Simmons Machine Tool Corp. 81
Simonds Mfg. Co. 43
*Sivyer Steel Casting Co. —
Sleeper & Hartley, Inc. 39
*Sly, W. W., Mfg. Co. —
Smith, Geo. H., Steel Casting Co. 49
Smythe, S. R., Co., Inc. 73
Snyder, W. P., & Co. 74
Soisson, Joseph, Fire Brick Co. 78
Sotter Brothers, Inc. 68
*Spencer Turbine Co. —
†Spowers, W. H., Jr. —
Standard Engineering Co. 39
†Standard Silica Co. —
Standard Stamping & Perforating Co. 61
Steel Plate Products Co. 68
Stewart Furnace Co. 74
Stowe-Fuller Refractories Co. 78
†Streine Tool & Mfg. Co., The —
†Strieby & Foote Co. —
Stroh Steel Hardening Process Co. 68
Strong, Carlisle & Hammond Co., The 41
Strong Steel Foundry Co. 47
†Sullivan Machinery Co. —
Summerill Tubing Co. 72
*Superior Basic Brick Co. —
Superior Steel Corp. 63
Superior Steel Products Co. 67
*Sutton-Abramsen Engineering Co. —
Swindell, Wm., & Brothers. 41

T

*Taylor Instrument Companies —
Taylor-Wilson Mfg. Co. 37
Technical Service Co. 83
†Tempest Brick Co., Ltd. —
Temple Malleable Iron & Steel Co. 51
Tennessee Coal, Iron & Railroad Co. 65
Thomas Spacing Machine Co. 39
*Timken Roller Bearing Co. —
Tioga Steel & Iron Co., The 53
Tippins & Sprengle, Inc. 82
*Titanium Alloy Mfg. Co. 90
Toledo Machine & Tool Co. 37
Transue & Williams Steel Forging Corp. 55
Treadwell Engineering Co. 39
†Trumbull Steel Co. 17
*Truscon Steel Co. Inside Front Cover
Tutein, E. Arthur, Inc. 74
Tyler Tube & Pipe Co. 68

U

*Union Drawn Steel Co. 9
Union Electric Steel Corp. 53
Union Mining Co. 79
Union Steel Casting Co. 47
†United Compound Co. —
United Engineering & Foundry Co. 15
†U. S. Cast Iron Pipe & Foundry Co. —
*U. S. Nickel Co. 77
U. S. Refractories Corp. 79
U. S. Silica Co. 45
U. S. Tool Co., Inc. 61
†Universal Boring Machine Co. —
Used and Rebuilt Equipment Section 81

V

Valley Mould & Iron Corp. 22
Vanadium Alloys Steel Co. 67
*Vanadium Corporation of America —
V. & O. Press Co. —
Vaughn Machinery Co. —
†Veeder Mfg. Co. —
Vermilion Malleable Iron Co. 49
Vulcan Iron Works 58
*Vulcan Mold & Iron Co. 64

W

†Wallace Equipment Co. —
Walsh Fire Clay Products Co. 79
*Walworth Run Foundry Co. 51
*Washburn Wire Co. 69
*Washburn Wire Co., Inc. —
*Webster Mfg. Co. 35
Weirton Steel Co. 62
*Wellman Products Co., The —
Wellman-Seaver-Morgan Co. 20
Wemlinger, Inc. 83
Westinghouse Electric & Manufacturing Co. —
*West Leechburg Steel Co. 63
West Steel Casting Co. 47
Wheeling Mold & Foundry Co. 18
Wheeling Steel Corp. 64
*Wheelock, Lovejoy & Co., Inc. 66
†Whiting Corp. —
*Whitney Metal Tool Co. —
†Whiton, D. E., Machine Co. —
Wickes Machinery Co. 82
Wilcox, D., Mfg. Co. 53
Williams & Co., Inc. 72
Williams, G. H., Co. 58
Wilputte Coke Oven Corp. —
†Wilson Welder & Metals Co. —
†Wisconsin Malleable Iron Co. —
Wood, Alan, Iron & Steel Co. 67
Wood, R. D., & Co. 41
*Wyckoff Drawn Steel Co. —

Y

Youngstown Sheet & Tube Co. —

Z

†Zanesville Malleable Co. —
†Zip Abrasive Co. —

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Seven heats of Plain Steel and seven of Titanium-Treated Steel were made, three pounds of Ferro Carbon-Titanium, per ton of steel, being used in the latter.

Yield of Sheet Bars	Good Bars	Front Crop	Other Crop
Untreated Steel	92.2%	2.6%	5.2%
Titanium-Treated Steel	94.1%	2.8%	3.1%

Percentage of total waster sheets after trimming

Untreated Steel	15.7%
Titanium-Treated Steel	9.7%

Percentage of wasters due to steel defects

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Untreated Steel	5.0%	5.6%
Titanium-Treated Steel	2.2%	3.9%

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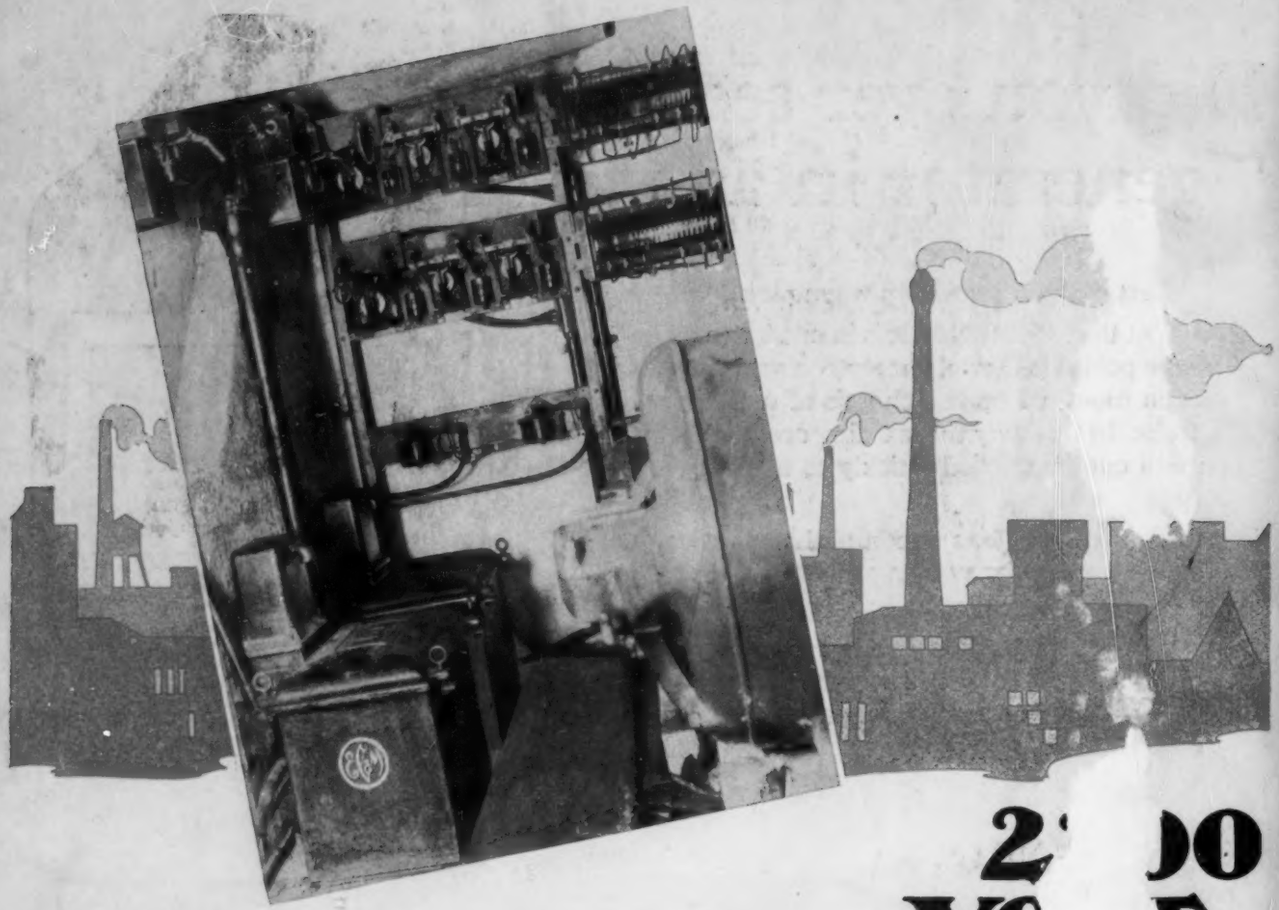

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These two EC&M Magnetic Controllers automatically start and stop motor-driven hydraulic accumulator pumps as the accumulator rams rise and fall. The motors are required to start against full load every few minutes.

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